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Eagle-Tumbleweed Draw Watershed
Eddy and Chaves Counties, New Mexico

U. S. DEPT. OF AGRICULTURE
SOIL CONSERVATION SERVICE

FINAL ENVIRONMENTAL STATEMENT

JUN 23 1975

Kenneth E. Grant
Administrator
Soil Conservation Service

Sponsoring Local Organizations

Central Valley Natural Resource Conservation District
2110 North Freeman
Artesia, New Mexico 88210

Penasco Natural Resource Conservation District
Hope, New Mexico 88250

Artesia-Eagle Draw Flood District
Box 1309
Artesia, New Mexico 88210

City of Artesia, New Mexico
Artesia, New Mexico 88210

October 1973

PREPARED BY

UNITED STATES DEPARTMENT OF AGRICULTURE

Soil Conservation Service

Washington, D.C. 20250

USDA ENVIRONMENTAL STATEMENT

Eagle-Tumbleweed Draw Watershed Project
Eddy and Chaves Counties,
New Mexico

Prepared in Accordance with
Sec. 102(2)(C) of P.L. 91-190

Summary Sheet

- I Final
- II Soil Conservation Service
- III Administrative
- IV Description of Project: A project for watershed protection and flood prevention in Eddy and Chaves Counties, New Mexico, to be implemented under the authority of the Watershed Protection and Flood Prevention Act (PL-566, 83rd Congress, 68 Stat. 666), as amended. Included in the project are:
 - One floodwater retarding structure with channels.
 - Two diversions.
 - Land treatment measures - Improved grazing management, brush control, livestock water facilities, improved irrigation systems, and irrigation water management.
- V Summary of Environmental Impact and Adverse Environmental Effects
 - 1. Elimination of flooding and associated damages in the City of Artesia leading to:
 - Upgrading of homes and businesses, creating better urban environment.
 - Accelerated urban renewal and land use planning.
 - Release of public and private monies previously needed for repairs and maintenance to other beneficial uses.
 - Reduction of health hazards such as vector breeding and water contamination.
 - Reduction of travel and service interruptions.

2. Reduction by 69 percent of flooding and associated damages on 3,040 acres of prime irrigated cropland leading to:
 - Preservation of soil resources.
 - Reduction of operation and maintenance costs.
 - Better use and conservation of irrigation water.
 - Retention of maximum options for future use.
3. Improvement of vegetative cover on uplands, leading to:
 - Reduction of soil erosion by five percent.
 - Increased quantity and quality of livestock forage and wildlife habitat.
4. Reduction of sediment from Eagle Draw into Pecos River by 57 percent.
5. Temporary disruption of ecological functions on 1,299 acres of rangeland by construction activities.
6. Destruction of about 69 acres of woody shrub vegetation occurring in Eagle Draw which furnishes habitat for wildlife species.
7. Removal of areas of brush in the upland which provide nesting and cover for birds and small animals.
8. Improved forage for wild herbivorous seed-eating animals.
9. Increased production and diversification of the composition of rangeland and shrubland vegetation within about 687 acres of the floodwater detention pool will create improved habitat conditions for wildlife species.
10. Fenced and seeded spoilbanks along both sides of the 20,100 linear feet of Channel 200 will provide high quality herbaceous food and cover for wildlife species.
11. The elimination of runoff overflow from about 720 acres of rangeland will result in reduction of vegetative diversity and production.

12. Creation of a potential hazard from drowning for a few small animals when detention pool fills rapidly.
13. Creation of some dust and noise pollution during construction.
14. Decreased water evaporation losses by about 260 acre-feet annually.
15. Commitment of about 1,299 acres of rangeland to dam, diversions, and channels.
16. Reduction of unemployment in project area by six percent.
17. Improvement of social and economic environment by increasing income and reducing costs of maintenance.

VI List of alternatives considered.

- A. Land treatment only.
- B. Floodproofing and zoning with land treatment.
- C. Diversion levee and channel work with land treatment.
- D. Floodwater retarding structures and channel work with land treatment.
- E. No project.
- F. General.

VII Written comments have been received from:

Department of the Army
Department of the Interior
Department of Commerce
Department of Health, Education, and Welfare
Environmental Protection Agency
New Mexico State Engineer (Governor's Representative)
New Mexico State Planning Office (State Clearinghouse)
Urban Renewal Agency of Artesia (Agency of HUD)

VIII Final statement transmitted to CEQ on December 21, 1973 .

Draft statement received by CEQ on April 10, 1972.

USDA SOIL CONSERVATION SERVICE ENVIRONMENTAL STATEMENT

Title of Statement: The Eagle-Tumbleweed Draw Watershed Project
Eddy and Chaves Counties, New Mexico

Type of Statement: Draft () Final (X)

Date: October 1973

Type of Action: Administrative (X)

Statement:

1. Description

Authority for Project: Federal Assistance through Public Law 566, 83d Congress, 68 Stat. 666, as amended.

Sponsoring Local Organizations: City of Artesia, Central * Valley Soil and Water Conservation District, Penasco Soil and Water Conservation District, Artesia-Eagle Draw Flood District.

Purpose of Project: Watershed protection and flood prevention.

Project Measures: The project plan provides for conservation land treatment measures, a floodwater retarding structure, two diversions, and an outlet channel.

Environmental Setting:^{1/}

Physical Data: The Eagle-Tumbleweed Draw Watershed, occupying parts of Chaves and Eddy Counties, is located in southeastern New Mexico. The City of Artesia, with a population of 10,000 is within the watershed and is the principal trade center for this rural area. The only other community of any size in the watershed is the Village of Hope, with a population of approximately 100 people. Hope is located 20 miles west of Artesia. Roswell, with a population of 34,000 is 40 miles north and Carlsbad, population 21,000, is 36 miles south of Artesia. The population in the watershed is estimated to be 11,000; approximately 94 percent is urban and six percent is rural.

^{1/} All information and data except as otherwise noted by reference to source, were collected during watershed planning investigations by the Soil Conservation Service, U. S. Department of Agriculture.

* Chapter 324, New Mexico Laws of 1973, changed the name of soil and water conservation districts to natural resource conservation districts.

The watershed is a part of the Rio Grande Water Resource Region No. 13 and the Upper Pecos River Subregion.^{1/} This subregion extends from the river's headwaters in the Sangre de Cristo Mountains in San Miguel County, New Mexico to Red Bluff Reservoir at the New Mexico-Texas state line. It includes San Miguel, Guadalupe, De Baca, Chaves, and Eddy Counties, New Mexico.

The terrain is rugged and mountainous in the northern sector, where the headwaters of the river are located, and also in the southwestern sector. The remainder is undulating to flat and is primarily rangeland. The southern sector also includes a substantial acreage of fairly level cropland. The watershed is fairly similar in aspect to the rest of the subregion except that it lacks the high mountains.

The Pecos River is highly mineralized because great quantities of evaporites and limestone are within reach of circulating ground waters. Sediment production within this subregion, however, is considerably less than that of the Rio Grande drainage area as a whole.

Population in the subregion is widely scattered. Six main population centers are Las Vegas, Santa Rosa, Fort Sumner, Roswell, Artesia, and Carlsbad. In addition there are some minor hamlets. These population concentrations have 83,650 people or 74 percent of the subregional total. The density of the remaining rural population is 26 percent or 30,067 people is three people for each two square miles.

The watershed includes 288.1 square miles (184,400 acres), of which 85.5% is rangeland; 7.2% is cropland; and 7.3% has miscellaneous uses such as farmsteads, roads, highways, railroads, and urban developments. The lower reaches are crossed from north to south by U. S. Highway 285 and the Santa Fe Railroad. The watershed area is well served by State and county roads.

Elevations in the watershed area range from 6,400 feet above mean sea level where Eagle Draw heads into the foothills of the Sacramento Mountains to 3,310 feet at Artesia. The watershed is approximately 55.5 miles long and average width is five miles. The water course is fairly well defined in the upper reaches of the watershed to the west edge of the Pecos River Valley where the topography becomes more level and gently sloping and has less definition. The flows spread and divide into the north and south branches and subsequently fan out through the City of Artesia and surrounding irrigated farmland. The north branch flows

^{1/} The Nation's Water Resources - 1970
U. S. Water Resources Council.

through the City of Artesia and the south branch flows along the south edge of the city. The Cottonwood-Walnut Creek Watershed area lies immediately north of the Eagle Draw drainage.

Eagle Draw, from its outlet to the Pecos River upstream for a distance of about six miles, was modified in 1970 and 1971. The lower half of this work was constructed by the Artesia-Eagle Draw Flood District. The upper half was installed within the city limits of Artesia as part of the Urban Renewal Project. These channels are not part of the watershed project.

Tumbleweed Draw heads about 17 miles west of the Pecos River. The north boundary of Tumbleweed Draw is the south boundary of Eagle Draw. Tumbleweed Draw flows through a small, low lying agricultural area into a well defined channel to the east before emptying into the Pecos River.

Both Eagle and Tumbleweed Draws are ephemeral streams and flow only during periods of surface runoff. There are no live streams or other surface water resources in the watershed.

There is a small area of wetland on the eastern edge of the project area along the Pecos River. The channel work constructed in 1970 and 1971 under authorities of the Artesia-Eagle Draw Flood District traversed approximately 8/10 of a mile of tamarisk vegetation. This wetland is classified as Type 1 - seasonally flooded basins or flats according to Fish and Wildlife Service Circular C-39. There are no other wetlands within the project area.

There are three major range sites within the watershed: (1) bottom land--on the lower reaches of the watershed and along the drainage ways; (2) loamy--on a large area through the center of the watershed; and (3) shallow--in the western half of the watershed above Hope and in complex with the loamy site. The climax vegetation consists of black grama, blue grama, sideoats grama, alkali sacaton, giant sacaton, and tobosa grass. Increaser plants include burrograss, catclaw, creosote bush, tar bush, mesquite, and cholla cactus.

The watershed is located in the Pecos Valley section of the Great Plains Physiographic Province. Eagle Creek, in the upper 27-mile reach of the watershed, is underlain by the hard limestone of the San Andres formation of the Permian age.

The drainage in the lower 27-mile reach is called Eagle Draw. It flows across a composite surface resulting from the formation and partial destruction of three terraces which generally form a series of broad steps rising from the Pecos River. The relief increases toward the west where Eagle Creek and Catclaw Draw, which are tributaries to Eagle Draw, have cut two broad, U-shaped valleys 50 to 80 feet below the general surface of the oldest alluvial terrace. A large mesa, capped by a conglomerate composed of limestone gravels, is located on the northern edge of the watershed about five miles north of Hope. The mesa is much higher and older than any of the terraces. The terraces, in ascending order, are Lakewood, Orchard Park, and Blackdom.

The climate is dry and moderately hot, with a mean average annual temperature of 60.8 degrees Fahrenheit. The average frost-free period is 196 days, extending from April 11 to October 17.

Records at Artesia show the average annual precipitation to be 11.75 inches. Most of the precipitation falls as high intensity rain during short duration thunderstorms. Extremes in annual precipitation range from a low of 3.97 inches in 1917 to a high of 36.31 inches in 1941.

Ground water and surface water are completely appropriated. Ninety percent or more of the water in the subregion is used for irrigation. In many areas, withdrawals of ground water exceed recharge rates, which often results in a deterioration of quality.

Municipal water wells for Artesia and the surrounding area are in the Eagle Draw alluvial fan. These are subject to contamination by flooding.

Developed mineral resources within the watershed consist of approximately 15 producing gas and oil wells. Leasing and exploration are continuing. There are no known metallic minerals in the area. Caliche pits are opened as needed for road construction materials.

Economic Data: Of the 184,400 acres in the watershed approximately 52,920 acres are federal land administered by the Bureau of Land Management, 45,390 acres are State land, and the remaining 86,090 acres are privately owned. Of the privately-owned lands 59,192 acres are rangeland, 13,430 acres are irrigated cropland and 13,468 acres are for miscellaneous use. A small amount of the miscellaneous land is publicly owned by local government.

The upper reach of the watershed is rangeland devoted to the production of cattle and sheep. The lower area contains irrigated cropland. There are 139 operating units in the irrigated portion of the watershed which range in size from 80 to 1,000 acres. There are approximately 30 ranches in the watershed totaling 59,192 acres. The average size of all farms and ranches is approximately 429 acres.

The principal crops grown on irrigated land in the watershed are alfalfa (55 percent) and cotton (37 percent). Annual crop production averages about six tons of hay per acre and one bale of cotton per acre. Other crops grown are corn, grain sorghum, castor beans, oats, barley and vegetables.

Rangeland in the upland areas is valued at \$35 to \$200 per acre while irrigated cropland in the lower end of the watershed is worth \$800 to \$1,000 per acre. Urban land values are estimated to be \$4,000 to \$6,000 per acre.

All farms and ranches in the watershed are readily accessible to roads and good highways, which provide the means for good truck transportation of agricultural products to markets. Rail transportation in and out of the watershed is also available through a rail terminal in Artesia.

Approximately 33 percent of the farms in the watershed contain land that is located on the floodplain. Many of these are family farms. They sustain flood damages totaling an estimated \$73,200 per year. All the farms and ranches are relatively near the primary trading center of Artesia in the major benefited area within the watershed.

A comparison of overall economic characteristics of the watershed to the Rio Grande Water Resource Region and Subregion is presented in the following table.

Comparison of Eagle-Tumbleweed Draw Watershed to Rio Grande Region and Subregion No. 1306

| I T E M | Unit | Rio Grande Region | Subregion #1306 (Chaves, Eddy, De Baca, Guadalupe, San Miguel Counties) | | Water- shed |
|---|---------|----------------------|---|--|----------------|
| | | | | | |
| Average size of all farms (includes ranches) | Acres | 3,378 | 5,000 | | 429 |
| Average value of land, buildings & equip. per farm for all farms | Dollars | 169,558 | 213,449 | | 67,817 |
| Proportions of major types of farm enterprises | | | | | |
| Percent of farms with crop enterprises (incl. field, truck, fruit & nut crops, hay, nursery products & misc.) | Percent | 75 | 59 | | 82 |
| Average size of farms with crop enterprises | Acres | 206 | 211 | | 97 |
| Percent of farms with livestock enterprises (incl. cattle, sheep, hogs, misc.), poultry & related products | Percent | 28 | 46 | | 17 |
| Average size of farms with livestock enterprises | Acres | 9,863 | 9,963 | | 1,973 |
| Percent of farms practicing irrigation | Percent | 58 | 49 | | 82 |
| Average amount of land irrigated per farm | Acres | 163 | 182 | | 97 |
| Percent of irrigated land that is cropland | Percent | 90 | 97 | | 45 |
| Agricultural land use under private ownership ^{1/} | Percent | 57 | 65 | | 39 |
| Percent of land area devoted to family farms (incl. ranches) | Percent | 33 | 37 | | 11 |
| Average size of family farm (incl. ranches) | Acres | 3,533 | 4,674 | | 245 |
| Percent of land area devoted to commercial farms | Percent | 24 | 28 | | 28 |
| Other agricultural land use (institutional farms, public lands used for grazing, etc.) | Percent | 7 | 2 | | 54 |
| Total percent of land used for agricultural purposes | Percent | 64 | 67 | | 93 |
| All other land use (public lands other than primary use for agriculture, urban areas, etc.) | Percent | 36 | 33 | | 7 |
| Distribution of agricultural income | | | | | |
| Field crops and hay | Percent | 33.7 | 14.1 | | 27.6 |
| Livestock and poultry | Percent | 57.6 | 81.7 | | 64.5 |
| Forest products | Percent | .1 | - | | - |
| Agricultural services | Percent | 1.2 | .5 | | .8 |
| Recreation | Percent | .4 | .1 | | - |
| Government programs | Percent | 7.0 | 3.6 | | 7.1 |

^{1/} Does not include institutional farms, public lands or owners or operators earning less than \$2500 per year from agr. production. Based on Class 1-5 Farms, 1969 Census of Agriculture.

The median family income presently averages \$7,541 for the two county areas in which the watershed is located. This compares to the state average of \$7,849.

The per capita income within the watershed is assumed to be the same as Eddy County which currently is \$3,114. This compares with the state average of \$2,882 and the national average of \$3,708.

The major sources of income in the two counties in which the watershed is located are distributed approximately as follows: 1/

| | <u>(Percent)</u> |
|--|------------------|
| a. Wages and Salaries | |
| (1) Mining | 15 |
| (2) Government | 12 |
| (3) Trade | 9 |
| (4) Services and Miscellaneous | 5 |
| (5) Manufacturing | 4 |
| (6) Transport and Utilities | 4 |
| (7) Construction | 3 |
| (8) Agriculture | 2 |
| (9) Finance and Real Estate | 2 |
| SUBTOTAL | 56 |
| b. Other Income | 3 |
| c. Proprietor Income | |
| (1) Business and Professional | 7 |
| (2) Farm | 9 |
| SUBTOTAL | 16 |
| d. Property Income | 15 |
| e. Transfer Payments | 10 |
| TOTAL | 100 |

1/ New Mexico Statistical Abstract, 1970, Bureau of Business Research, University of New Mexico.

The average percent of unemployed workers in Chaves and Eddy Counties increased from 4.1 to 6.4 percent in the period from 1961 to 1971. During this same period the unemployment rate for New Mexico declined from 6.4 to 4.8 in 1969 and then increased to 6.4 percent by 1971. At the same time the number of workers declined in six of the 10 sectors of the economy. These were agriculture; construction; wholesale and retail trades; mining; transportation, utilities, communications; and finance, insurance and real estate.

Fish and Wildlife Resources: There is no fisheries habitat within the project area.

Upland wildlife species include rabbit, mourning dove, scaled quail, ring-necked pheasant, mule deer, songbirds, various small mammals and reptiles. Habitats for these species are provided by distinct vegetational patterns associated with land uses. These habitat types are:

1. Rangelands, in upland positions and not influenced by moisture relations associated with existing drainage patterns.

2. Shrublands, containing riparian or moisture-related woody vegetation, occurring along segments of the existing drainage patterns. Major species of vegetation with wildlife habitat values include hackberry, Arizona walnut, little leaf sumac, mesquite and associated grasses and forbs. The moisture-related vegetation occurs in strips not more than 300 feet in width, totaling about 86 acres in the proposed construction area.

3. There is one area of low lying rangeland which receives overflow water from Eagle Draw. The moisture-related vegetation occurs adjacent to both arms of the draw above 26th Street. There are approximately 720 acres of this type of wildlife habitat at this location. Vegetation includes a variety of perennial grasses and annual forbs, catclaw, mesquite, yucca and cactus.

4. Downstream from urban Artesia, the already constructed channel passes through a different habitat type that is dominated by irrigated croplands. There is very little wildlife habitat along the field borders or ditch banks through 2-3/8 miles of alfalfa fields or 1-1/8 miles of cotton fields. Within the lower two miles of channel which passes through rangeland, the channel bottom is being reinvaded by tamarisk. Adjacent land is type 1 wetland.

The wildlife habitat types found within the project area do not represent any qualities of significance. Wildlife populations in the watershed are not large and are similar to populations occurring over a very large land area.

There are no known rare or endangered animal species within the project area. There are no influences of pollution which affect wildlife resources. Public access is generally available throughout the project area.

Recreational Resources: Within, or nearby the City of Artesia, there are two city parks, three golf courses, two hunting preserves, one water sports area, and numerous horse riding facilities. The 1971 Outdoor Recreation Comprehensive Plan for New Mexico indicates that there are 188,273 acres of public recreation lands in Eddy County. In Planning and Development District No. 6, within which Artesia is centrally located, the major recreation needs indicated were tennis courts, developed parks, picnic areas, and boating areas. The plan shows that a five-year acquisition and development schedule will provide: an 18-hole golf course at Carlsbad; a regional park and lake at Hobbs; a State park and lake at Artesia; a wilderness area at Carlsbad; expansion of a city park at Carlsbad; picnic and campground facilities in Lincoln National Forest; picnic facilities and scenic drive expansion at White Sands National Monument; and a Pecos River Trail system.

Existing public and private recreation facilities developed in Planning and Development District No. 6 have been identified and are as follows:

| | |
|--|-------|
| a. Picnic units | 1,017 |
| b. Swimming pools and beaches | 67 |
| c. Acres of land intended for hunting . . . | 6,320 |
| d. Acres of water surface of lakes for fishing and recreation | 6,733 |
| e. Miles of fishing streams | 54 |
| f. Number of boat accesses to lakes | 4 |
| g. Available boat moorings | 40 |
| h. Miles of trails | 27 |

None of these facilities exist in the watershed except a few of the picnic units which are located in Artesia's community park.

The watershed area has no identified archeological, historical, scientific, or scenic values. This information was provided by the Museum of New Mexico. In addition, the National Register of Historic Places shows no sites which would be affected by the project.

Soil, Water and Plant Management Status: There has been little change in land use over the past decade. It is not expected that the cropland area will expand in the foreseeable future; all the irrigation water is presently appropriated and new sources are not planned. On the other hand, it is likely that urban expansion will reduce the cropland acreage over the years. There is no established trend, however, that could be used to predict the rate of conversion.

The status of applied land treatment is excellent. There are few units of production committed to marginal or sub-marginal soil resources.

Activities of the Central Valley and Penasco Natural Resource Conservation Districts include working with individual farmers and ranchers to develop basic conservation plans with emphasis on proper use of range and irrigation water management; assisting units of government (county and city) to promote proper land use; conservation education; sponsoring two PL-566 watersheds; and participating with the Southeastern New Mexico Resource Development District in resource conservation and development.

Eighty-three percent of the watershed area is covered by cooperative agreements between landowners and the two NRCD's. Cooperators of the two NRCD's include 121 landowners within the watershed, of which 98 have basic conservation plans. Sixty-five percent of the planned practices are presently applied.

The status of other programs and influences affecting adequacy of management in the watershed is excellent. Assistance from the Rural Environmental Assistance Program, Great Plains Conservation Program, New Mexico Extension Service, Bureau of Land Management, New Mexico State Land Office and others has been excellent in the past. Reduction of funds or lack of increase in funds will reduce the effectiveness of all of these programs.

Water and Related Land Resource Problems:

Land Treatment: Annual erosion rates are low throughout the watershed area because of gentle slopes in the lower part and good grass cover on most of the upper parts. Lack of optimum forage production and improper distribution of use are the major land treatment problems on the rangeland.

Cropland is located on deeper soils and more level lands. Irrigation water management, lining of irrigation ditches, leveling and irrigation structures are the conservation practices needed to bring about more efficient use of irrigation water.

Some land use adjustments are expected to occur during the project period due to increased urbanization near the City of Artesia, this being the cropland area. Very few land use adjustments are expected in the rangeland area.

Committed factors of production are efficient at the present time because none are allocated to sub-marginal lands.

Most landowners and operators are financially able with the help of GPCP to apply needed conservation measures. Allocation of funds for the practices, as well as technical assistance available, will determine in part the rate at which practices will be planned and applied.

Floodwater Damage: The total area subject to floodwater damage is 4,970 acres, of which 3,040 acres are cropland and 1,930 acres are in urban use.

Local high intensity thunderstorms covering a few square miles, or general storms over most of the watershed, contribute to the flood frequency. Rapid runoff from the steep, shallow soil areas, and from the sparsely vegetated areas, causes flooding. Sediment from the eroding watershed soils is deposited in alluvial fans when sediment-laden water reaches the gently sloping valley. During floods, sediment and debris clog natural waterways, and floodwater, with its load of sediment and debris, is carried into the streets and urban property of Artesia. Sediments also spread over farmland, across roads, highways and railroad tracks. Water trapped in low areas becomes odorous and provides a breeding place for mosquitoes and other vectors.

Damaging floods from local thunderstorms normally occur during summer and early fall months, while damaging floods from general storms occur from spring to late fall. Floods, inundating areas of Artesia and large acreages of the surrounding cropland, occur on an average of once every three or four years. Some of the more damaging floods occurred in 1905, 1908, 1911, 1919, 1928, 1937, 1941, 1948, 1954, 1964, 1965 and 1966.

Based on available records, the 1954 and 1964 floods would have recurrence intervals of 40 and 30 years, respectively. The 1954 flood was caused by a general storm covering most of the watershed while the 1964 flood was caused by a high intensity thunderstorm covering approximately 50 square miles of the Eagle Draw Watershed located just west of Artesia. The storm also covered 30 square miles of the Cottonwood-Walnut Creek Watershed just northwest of Artesia.

The 1965 flood inundated approximately 2,400 acres of cropland, causing direct agricultural damages estimated at \$504,000. It also caused an estimated \$1,487,000 of direct damages to the City of Artesia. Total estimated direct damages from the flood amounted to \$1,997,000.

When flooding occurs in Artesia, four separate areas within the city become inundated. In some locations, flooding exceeds three-foot depths. It is estimated that damages in the watershed begin with a storm having a 25 percent chance of occurrence. A storm having a one percent chance of occurrence would produce a peak discharge of approximately 20,000 c.f.s. under present conditions at the point where north Eagle Draw crosses 26th Street. The flow from the June 13, 1964 flood (30-year return period) at the north Eagle Draw crossing on 26th Street was estimated to be 10,000 c.f.s.

In northern Artesia, there is an overlapping effect between the Eagle-Tumbleweed Draw and Cottonwood-Walnut Creek Watersheds when flooding occurs. Consequently, damages in these two areas are caused by flooding from both the Cottonwood-Walnut Creek and the Eagle-Tumbleweed Draw Watersheds.

Within the one damage area in the northern section of the city, an urban renewal project includes the anticipated building of 144 homes that would be subject to damage from flooding. Projected are 486 homes expected to be constructed in this same damage area, but outside the urban renewal area.

The city is experiencing expansion throughout the four damage areas. Consequently, if the city remains unprotected, it will face increasingly greater damages.

Erosion Damage: Soil erosion in the watershed is low and occurs primarily on rangeland in the upland portion of the watershed. The average annual gross erosion rate is estimated to be 0.40 acre-foot per square mile. It is estimated that sheet erosion accounts for 85 percent of the sediments. Gullying and streambank erosion account for the remaining 15 percent. There are no critical sediment source areas in the watershed.

Farmland along the west side of the Eagle Draw floodplain receives moderate to severe erosion damage on an average of once every five years. In each case, topsoil is washed from these farms and deposited either on grassland or other farmland. In the 1954 flood, a total of 580 acres were damaged from either erosion or deposition of sediment to the extent that re-shaping or re-leveling of land was necessary. Estimated average cost of this operation was \$10 per acre. Generally, the scouring is minor and occurs when floodwater overtops borders of bench-leveled fields and spills onto the next lower bench.

Sediment Damage: Sediment deposition occurs in the form of a thin veneer because of the fine-grained texture of the clays and silts which comprise the sediment material. Approximately 310 acres of agricultural lands and 164 acres of urban property are damaged by sediment on an average annual basis. Approximately 3,040 acres of agricultural land and 1,930 acres of urban area are subject to sediment damage by a storm of one percent chance of occurrence. (A magnitude of storm which can be expected to occur once every 100 years).

There is minor swamping damage due to storms in the watershed. There are no reservoirs or drainage facilities in the watershed.

Irrigation developments occasionally are damaged, when the distribution canals are filled with sediment or sediment deposition occurs on leveled fields, thereby necessitating re-leveling for efficient farming operation. All irrigation water is pumped from wells and sediment has no effect on water quality.

The average annual sediment yield at the mouth of the watershed is approximately 34 acre-feet, most of which is transported by the Pecos River to Lake McMillan. Sediment damages are estimated to average about \$37,040 annually.

Drainage: There is no agricultural drainage involved in this watershed.

Irrigation: The present irrigated area is on deep, highly productive soils. There is no potential for increasing the acreage because the water basin is fully allocated.

Except for the area around Hope, New Mexico, which is irrigated when water is available from flood flows in the Rio Penasco, all land is irrigated from wells. The water allocation allows 3.5 acre-feet of water for each acre with water right. There is no surplus now nor is there any anticipated in the foreseeable future. The quality of the water presents no problems for agricultural uses.

Existing irrigation systems are adequate but need conservation practices that will save water in transit and efficient use of irrigation water. The water allocation is inadequate for maximum alfalfa production despite well adapted varieties and suitable soils.

Municipal and Industrial Water: The City of Artesia has a current population of 10,000. This was a decline of approximately 2,000 between 1960 and 1970. The projected population

for the year 2000 is expected to be 34,000. The existing supply of municipal and industrial water is adequate and of good quality. Protection of municipal wells from flood water is needed.

Future demands and needs are not expected to be very great but if demands develop, water rights now used for agriculture can be transferred to municipal or industrial use.

Recreation: There is a current shortage of facilities for water-based recreational activities within the Planning and Water Development District No. 6. Other activities which have sufficient facilities or provisions are in need of improvements or further development.

The future potential of recreation by 1990, in the watershed area, is indicated by the change in demand for the 10 most popular current activities. These changes are shown in the following table^{1/} according to the popularity of the activity:

| <u>Activity</u> | <u>Percent Currently Engaging in This Activity</u> | <u>Percent Change In Demand 1970-1990</u> ^{2/} |
|--------------------------------------|--|---|
| 1. Pleasure driving | 63 | 72 |
| 2. Picnicking | 62 | 74 |
| 3. Walking for pleasure | 58 | 84 |
| 4. Attending outdoor sporting events | 54 | 66 |
| 5. Fishing | 53 | 45 |
| 6. Car sightseeing | 52 | 75 |
| 7. Pool swimming | 45 | 84 |
| 8. Hunting | 40 | 1 - |
| 9. Bicycling | 37 | 44 |
| 10. Horseback riding | 27 | 74 |

^{1/} Data from Comprehensive Outdoor Recreation Plan for New Mexico, 1971.

^{2/} Percentages shown are plus changes unless otherwise indicated.

The limited recreational resources in the community park at Artesia are fully utilized and oftentimes crowded. These facilities consist primarily of golfing and picnicking.

Economic and Social: It is estimated that 6 percent of the family farms in the watershed are low income-producing units. This compares with 3 percent for the subregion.

The average gross income from agricultural products produced in the watershed averages \$20,100 per farm and ranch compared to \$82,400 per farm and ranch for the subregion.

The percent of families living below the poverty level averages 19.1 percent for Chaves and Eddy Counties compared with an average of 18.5 percent for the State of New Mexico.

A further indication of the level of the economy in this area is that Eddy County is included in the Four Corners Development Area, and Eddy County is presently designated by the Economic Development Administration as being an area of chronic unemployment and underemployment.

There is a growing need for employment opportunities in Chaves and Eddy Counties. From 1961 to 1971, employment in the two counties declined in six of the 10 major sectors of the economy including agriculture.

The largest decline occurred in the construction sector. This amounted to a 69 percent reduction in the number employed in construction work. Agricultural workers declined 14 percent during this period.

The remaining four major sectors which also had a decline in the number employed include: Wholesale and retail trades; mining; transportation, utilities and communications; and finance, insurance and real estate.

There is a need to promote rural community development within the watershed and surrounding area. This is indicated by the following factors:

1. The 6 percent of low income-producing farm units in the watershed are double the percent of low income units in the subregion.
2. The median family income in the area is approximately \$300 less than the state average.
3. Nineteen and one-tenth percent of the families in the two-county area in which the watershed is located live below the poverty level.
4. The number of agricultural workers in Chaves and Eddy Counties has declined 14 percent over the past decade.
5. The unemployment rate in the area of the watershed has steadily increased (by 56 percent over the past decade), which indicates the declining number of agricultural workers is not being offset by employment in other sectors of the economy.

6. Flood damage to agricultural land in the watershed averages \$73,200 per year.
7. Prices paid by farmers have increased 18 percent over the past 10 years, which has made farm operations more costly and reduced profit margins accordingly.
8. Irrigation water has been declining over the past decade.
9. Forage is depleted on rangeland.
10. There is an increasing demand for agricultural land to be used for rural living by nonagricultural workers.
11. A desirability to preserve aesthetic values within the watershed.

Planned Project:

Land Treatment Measures: Land treatment measures on public domain lands are cooperatively planned with the assistance of the Bureau of Land Management and the Soil Conservation Service. This land, consisting of 52,920 acres, is all rangeland. The principal treatment will be improved grazing management - proper grazing use and deferred grazing. The treatment is aimed at improving ground cover and increasing forage production, as well as watershed management and wildlife habitat improvement.

Brush control measures will be limited to those sites where the woody species are not a part of the potential plant community. Control measures will be carried out in planned patterns to enhance wildlife habitat and the natural landscape.

Private and State-owned rangeland, 104,582 acres, will also be treated for improved ground cover and increased forage production. In addition to grazing management other practices will be applied such as livestock water facilities, fencing, brush control and wildlife habitat improvement.

Irrigated cropland, all privately-owned, and consisting of 13,430 acres, will receive treatment aimed at efficient irrigation water use, erosion control, and more efficient crop production. The treatment will include such practices as irrigation water management, land leveling, irrigation ditch lining, improved irrigation systems and conservation cropping systems.

All of the necessary treatment measures will be installed during the period of project installation and will be maintained thereafter. The cost of installing land treatment measures is estimated to be \$397,500, of which \$9,900 in technical assistance will be from PL-566 funds.

Structural Measures: Planned structural measures include one floodwater retarding dam, a channel and two floodwater diversions, as shown on the Watershed Project Map. Estimated installation cost for these measures is \$7,113,200. This includes \$6,866,100 to be paid from PL-566 funds and \$247,100 which will be paid from other funds.

The floodwater retarding structure is a single-purpose structure providing for temporary storage of floodwater and for its controlled release at a non-damaging rate. In addition the structure collects the sediment yields from the contributing watershed area and permanently stores the sediment for the life of the structure.

The floodwater retarding structure will have a compacted earthfill embankment and a reinforced concrete chute emergency spillway with an energy dissipating outlet structure. The principal spillway will consist of 2-stage drop-inlet risers, a reinforced concrete box culvert barrel approximately 215 feet long, and an energy dissipating outlet structure. Combined capacity of the principal and emergency spillways will pass the routed freeboard hydrograph without overtopping the dam.

Maximum height of the embankment will be about 56 feet. It will be about 21,600 feet (4.09 miles) long with a 19-foot crown width. It will have a 3:1 upstream slope and a 2:1 downstream slope with a 15-foot berm located about 27 feet from the top. The embankment will contain about 2,400,000 cubic yards of fill. Approximately 5,300 cubic yards of reinforced concrete will be required for the emergency and principal spillways.

Storage capacity to the emergency spillway crest elevation will be about 14,200 acre-feet with 1,931 acre-feet available for the estimated 100-year sediment volume. Retarding storage and principal spillway flows will control about 63 percent (116,000 acres) of the watershed from a 100-year frequency storm. The structure is designed to have a life of 100 years.

Ungated openings in the principal spillway riser will drain the reservoir (including the sediment pool). The openings are sized to remove flood flows, from a 25-year, 6-hour storm, in 96 hours or less as required by the State of New Mexico.

Current land use in the areas to be acquired is all rangeland. A fence will be built around the embankment. During construction, some of the coarser materials available in the borrow area will be selectively placed on the faces of the embankment slopes. The embankment will not be vegetated.

Construction easements needed for about 1,050 acres, and flowage easements for 591 acres will be acquired from four private landowners and the Bureau of Land Management. A subordination agreement will be required to modify the telephone line at the upper end of the earthfill. Fences within the construction area will be removed and reconstructed.

Channel 200 will convey the principal spillway discharge from Site 2B to the upstream end of the Urban Renewal Channel at 26th Street (west side of Artesia, New Mexico). The two floodwater diversions will also discharge into Channel 200. The channel will be about 3.81 miles (20,100 feet) long and will follow the existing natural water course with some minor realignments (see Project Map). Its capacity will be the maximum principal spillway discharge of about 2,000 c.f.s.

It will be an excavated earth channel with approximately a 94-foot bottom, 2:1 side slopes and a minimum depth of 10 feet. Dikes along the sides will have a 15-foot top and 2:1 side slopes. Eleven reinforced concrete drop spillways, each with a 10-foot drop, will be installed. They will be proportioned to carry the channel capacity. Approximately 2,540 cubic yards of reinforced concrete will be required for the drop structures.

The outlet structure on the principal spillway and the concrete drop structures are designed to dissipate the energy of the flows and spread them the full width of the channel.

Approximately 992,000 cubic yards of earth will be excavated. Earthfill for dikes will be approximately 237,000 cubic yards. Excess excavation will be placed on the floodwater retarding dam and on spoil banks along each side of the channel. The spoil banks will be seeded to grass and permanent fences will be installed to permit establishment and management of the vegetation.

Construction easements for approximately 210 acres from eight landowners will be acquired. All the area is rangeland. A subordination agreement with a utility company will be required. The powerline will be modified as needed during construction.

Downstream from each drop spillway, soil cement maintenance crossings will be installed. Soil cement runoff inlets will be provided at locations where local runoff enters the channel.

The two floodwater diversions will divert the 100-year frequency storm runoff, from the watershed area between the diversions and Site 2B, into Channel 200. Floodwater Diversion No. 1 will control 2.4 square miles on the south side of Channel 200. It will be just west of and parallel to 26th Street, Artesia, New Mexico. It will be approximately 6,500 feet long. The diversion will be an earth channel with a 30-foot bottom, 3:1 downstream slope, a 10:1 upstream slope, with an earthen dike on the downstream side of the channel.

Floodwater Diversion No. 2 will control 2.6 square miles on the north side of Channel 200. It is located at a point about 3,500 feet upstream from 26th Street where a ridge converges with Channel 200. The diversion dike will be approximately 1,600 feet long, with a 14-foot top and 3:1 side slopes. The channel portion will have a 70-foot bottom width, with 3:1 side slopes.

Reinforced concrete drop structures will be installed at the locations where the two diversions enter Channel 200. Approximately 200 cubic yards of reinforced concrete will be required.

Land rights for both floodwater diversions include about 32 acres for construction easements and about 38 acres for flowage easements. They will be acquired from nine landowners. There will be no relocations or displaced persons, business, and farm operations resulting from acquisition of land rights for the structural measures.

A subordination agreement with a utility company will be required. A low water road crossing will be installed across F.D. 1. Modification of a powerline and a pipeline will be required during construction. Fences within the construction area will be removed and rebuilt.

Dust pollution will be minimized during construction of this project by requiring the contractor to sprinkle and wet all roads leading into the construction site and those roads used by equipment within the construction area. Borrow areas will also be sprinkled and wetted prior to excavating and placing the materials on the embankment.

Land treatment measures applied on private, state-owned and Bureau of Land Management Type IV land will be maintained by the landowner or operator. The landowners and operators have cooperative conservation agreements with the Central Valley and the Penasco Natural Resource Conservation Districts. The Bureau of Land Management and permittees will maintain land treatment measures installed on Type I land.

Representatives of the sponsoring local organizations and the Soil Conservation Service will make a joint inspection of the structural measures annually and after each major flood for three years following installation of the structure. The inspection(s) will be made to determine the need for maintenance and repair and, if required, when it will be accomplished. Inspections after the third year following installation will be made annually by sponsors and a report prepared by them. A copy of the report will be furnished to the Soil Conservation Service.

The operation and maintenance of the structural measures will be the responsibility of Artesia-Eagle Draw Flood District. The estimated average annual operation and maintenance cost for floodwater retarding structure Site 2B is \$6,760, and the cost for Channel 200 from Site 2B to 26th Street and the diversions is \$13,220.

Some damage to structural measures can be expected from the runoff of major storms. Items to be considered in maintaining the structural measures include, but are not limited to, the condition of the principal and emergency spillways and earthfill of the floodwater retarding structure. The outlet channel will require removal of sediment deposits, weeds and debris. The growth of grass in the channel should be promoted where possible; however, it should be mowed periodically. The outlet channel shall be maintained in such a condition that the designated flow can be conveyed safely.

The sponsoring local organization will effectively and in a timely manner effectuate all necessary maintenance and will operate the entire project in accordance with the legal permits granted for construction. The project operations will be in accordance with the state and local laws and in accordance with the limitations specified in granting such things as construction permits, etc.

The Urban Renewal Channel through Artesia and Artesia-Eagle Draw Flood District channel east of Artesia will be maintained in such a manner that the project works will operate as planned.

The Artesia-Eagle Draw Flood District and the Soil Conservation Service will enter into a specific operation and maintenance agreement prior to signing a land rights or project agreement.

Since Eagle Draw is an ephemeral stream and flows only during periods of surface runoff, there are no low flows. The project will have no significant effect on the smaller stream flows from surface runoff, as the water will not be permanently impounded.

Any environmental problem that may result from geologic or hydrologic conditions should be recognizable from pre-construction investigations, and their correction should be well within the range of standard engineering practice.

The Museum of New Mexico provided information on the location of places of archeological or historical value in the construction area. The agency is to be notified if locations are found during construction. The Soil Conservation Service will keep the agency informed of progress in the project, so that in the event locations are discovered, possible salvage can be carried out prior to construction.

Although the floodwater retarding structure and associated works of improvement provide protection only up to the 100-year frequency storm, the structure is designed to safely pass the peak flow from the storm generated by the probable maximum precipitation. Floodwaters will begin to pass through the emergency spillway once the 100-year frequency is exceeded. In view of this, a potential hazard, including high damages and possible loss of life, could result from a false sense of security. The local sponsors will periodically publicize the limitations of the project with respect to preventing flood damages from Eagle Draw.

2. Environmental Impact

The greatest impact of the project will be the reduction of damages from flooding to urban and rural properties. To a lesser degree, but nonetheless important, will be the effects on soil erosion and resulting sediment production; sediment deposition; quality of land, water, and related resources; and the social and economic well being of people in the project area. Minor impacts also will be felt on the aesthetic character of the area and on the wildlife resources. The irrevocable commitment of a small parcel of land to the dam, diversions and channels will affect the future options for use of this land. Directly affected will be about 100 farmers and rural residents, 1,700 homes and 150 businesses in the City of Artesia, and users of downstream lakes.

Flood Prevention, Erosion, and Sediment: The combination of structural measures--dam, diversions, and channel work--will protect the City of Artesia from flooding and associated sediment damage. Under present conditions the flow through Artesia from a storm, the size of which has a probability of occurring an average of once every 100 years (a 1 percent chance event) would be 20,000 cubic feet per second. The project will reduce this flow to 2,000 c.f.s., a volume that will be confined within the improved channel. Flooding of homes and businesses will be virtually eliminated--over 99 percent reduction. Remaining would be insignificant flows from below the dam and from street runoff.

Elimination of flooding will have numerous impacts within the city, not the least of which will be a sense of confidence and well being among the people. Homes and business establishments can be improved and upgraded without fear of investment loss, creating a more pleasant urban environment. This in itself will promote growth and development. Urban renewal and land use planning can be accelerated. Monies needed by private citizens for repair of structural damage can be diverted to other beneficial investments, improving the quality of life for a substantial number of people.

Damage to streets and other public facilities and the need for funds for repair and maintenance of these will be greatly reduced. The funds can be diverted to improving public parks and recreation facilities which enhance the quality of the environment. Interruptions of travel and services and the general inconvenience and nuisance of flooding will be eliminated.

No loss of life has been attributed to Eagle Draw flooding; however, the potential exists. The project will greatly reduce this hazard. In addition, health hazards-- specifically, vector breeding areas created by ponded floodwater and potential contamination of water supplies--will be greatly reduced.

The agricultural land adjacent to Artesia will be protected from flood damage from the storm with one percent chance of occurrence. This area, 3,040 acres, is prime irrigated cropland. Damages in terms of sediment deposition, loss of crops, impairment of ditches and canals, disruption of irrigation water, and delayed farming operations will be reduced by 69 percent.

Effects of protecting this land are: preservation of a valuable, non-renewable soil resource; improvement of the use and conservation of irrigation water; reduction of

costs for operation and maintenance of the irrigation facilities; preservation of the maximum number of future options for land use; and general improvement of the well-being of the farmers involved. Additional social and economic effects are discussed on following pages.

The project will control runoff and sediment from the 181 square mile drainage of Eagle Draw. The 57 percent reduction of sediment from this drainage is significant to the Pecos River. The estimated annual value of the sediment reduction--from 34 acre-feet to 15 acre-feet--is \$21,000 in terms of recreation values to Lakes McMillan and Avalon, which are on the Pecos River below the outlet of Eagle Draw. The reduction in peak flows and other minor effects are considered insignificant.

Land treatment practices on the watershed uplands will reduce soil erosion and sediment production by about five percent. These practices will improve the ground cover, increase livestock forage production, improve quality of the forage, and generally increase food and cover for wildlife.

No known places of archeological or historical significance exist in the area; however, all possible precautions and measures will be taken to preserve these if they are discovered.

The project will have a slight effect on the total water supply of the basin in that water losses from evaporation will be reduced by an average of about 260 acre-feet annually.

Additional effects of a minor nature will be the creation of some noise and dust pollution during construction, the disruption of the landscape by the earth structures, and the commitment of about 1,299 acres of low value rangeland to the dam, diversions, and spillways.

The finished structural works will detract somewhat from the landscape. All practical means will be used to make the structures compatible with the surroundings.

Economic and Social: The watershed is included in the Four Corners Development area which is associated with the Public Works and Economic Development Act of 1965. It is estimated that unemployment in the project area will be reduced by as much as six percent per year during the four-year installation period. This reduction will be brought about by the increased employment opportunities in the construction phase, and by other secondary activities.

The distribution of rural population within the watershed will remain relatively constant. With the project installed, increases in population over and above normal growth are expected in Artesia. This will create additional employment, especially in wholesale-retail trades and in services.

Rural development in general will be advanced by the project. The quality of living, particularly in the rural area of the watershed, will eventually be improved by the project. Higher farm income per farm, a feeling of security because of flood protection, and the ability to improve the land with minimum losses from flooding will create the means and desire for better farm living.

The efficiency of agriculture will be improved by reducing replanting and fertilizer cost. This in turn will reduce the fertilizer and other related pollutants that are presently deposited in the Pecos River.

Conversion to higher value crops will result from the removal of the flood hazard. The risk of growing such crops is too great without the project. Major crops presently grown on the cropland include cotton, alfalfa, and grain. A significant shift from alfalfa production to vegetable crops is expected. The increased intensity of crop production resulting from the shift of a portion of the alfalfa to vegetable production is an effect of the project and not a purpose for the project. Improved irrigation water management will be realized due to greater economic incentives and the acceleration of technical assistance to farmers.

This project will expand the rural economic base. Annual agricultural benefits of \$50,600 in the form of cost savings will release income for needed goods and supplies that cannot be afforded under present conditions. Making additional income available in this manner will, in turn, generate other income. Secondary benefits will be \$64,400.

The average annual cost of the project is \$387,000 compared to \$879,800 benefits. The benefits include \$95,600 re-development benefits, and \$64,400 secondary benefits. The benefit cost ratio is 2.3:1.

Recreation: The project will have no effect on established or potential recreation resources except as more funds may be available for improvement of facilities as noted on page 22.

Fish and Wildlife: Construction of the floodwater retarding dam will destroy about 24 acres of rangeland habitat and, including the sediment pool, about 32 acres of the shrubland habitat. The shrubland type contains woody species, such as hackberry, Arizona walnut, and little leaf sumac which provide nesting, roosting and escape cover for the small resident populations of scaled quail, mourning dove, ring-necked pheasant and songbirds. Following construction, the dam will not be seeded, but will be fenced. In time, the surface of the dam will become naturally revegetated with native grasses, forbs and shrubs. The floodwater detention pool, excluding that portion which will store sediments, will be about 687 acres in area. It is anticipated that the periodic storage of water will induce an improvement in vegetative composition and production which will be utilized by rabbits, other small mammals, scaled quail, ring-necked pheasant and songbirds.

Construction of 20,100 lineal feet of Channel 200 from the dam to 26th Street will destroy about 5,400 lineal feet of shrubland vegetation, or about 37 acres. This action will eliminate the value of this segment of Eagle Draw for the small resident populations of birds. Channel construction will include the seeding of grasses and the erection of permanent fencing on spoil banks located on both sides of the entire length of the channel. About 138 acres of permanent grassland will be established. This action will increase the herbaceous and insect foods, as well as low cover, that will be available to rabbits, other small mammals, scaled quail, ring-necked pheasant and ground-nesting songbirds.

Construction of floodwater diversions 1 and 2 will destroy native rangeland vegetation on an area averaging 140 feet in width and 8,100 feet in length. The diversions will not be seeded, but over time, will become naturally revegetated. This action will eliminate the runoff overflow now influencing about 720 acres of rangeland which produces a vegetational pattern and composition that has moderate value as habitat for the small numbers of scaled quail, jackrabbit, and shrub-nesting songbirds utilizing the area.

While wildlife populations which are resident in the proposed construction areas are low, there will be a temporary disruption of normal activity during the periods of construction. Following the completion of construction it is expected that wildlife populations will readjust to the limits of the new habitats. A potential hazard, for a few small animals which may drown, will be created when the detention pool fills rapidly.

Control of brush is planned as a part of upland land treatment. Control measures will be applied only on range sites where a grassland plant community is ecologically well adapted, and in patterns which will be designed to enhance wildlife habitat. These actions will improve forage for wild herbivorous and seed eating animals while reducing the local availability of nesting sites for shrub-nesting songbirds.

There are no known rare or endangered species in the project area. There is no evidence that the project area provides suitable habitat for any threatened species of wildlife listed as occurring in New Mexico in the 1973 Edition, "Threatened Wildlife of the United States," United States Department of the Interior. The Pecos Gambusia (*Gambusia Nobilis*), listed by the Bureau of Sport Fisheries and Wildlife as "greatly depleted" ... "over its former distribution" might exist in the general area. However, there is no evidence of its presence in the area affected by the project.^{1/}

3. Favorable Environmental Effects

a. Elimination of flooding and associated damages in the City of Artesia leading to:

- (1) Upgrading of homes and businesses, creating better urban environment;
- (2) Accelerated urban renewal and land use planning;
- (3) Release of public and private monies previously needed for repairs and maintenance to other beneficial uses;
- (4) Reduction of health hazards such as vector breeding and water contamination;
- (5) Reduction of travel and service interruptions.

b. Reduction by 69 percent of flooding and associated damages on 3,040 acres of prime irrigated cropland leading to:

- (1) Preservation of soil resource;
- (2) Reduction of operation and maintenance costs;
- (3) Better use and conservation of irrigation water;
- (4) Retention of maximum options for future use.

^{1/} Symposium on Rare and Endangered Wildlife of the South-western United States held at Albuquerque, N.M. September 22-23, 1972. Op. cit. "Endangered Non-game Fishes of the Upper Rio Grande Basin"; C. Hubbs and A. A. Echelle.

c. Improvement of vegetative cover on uplands, leading to:

- (1) Reduction of soil erosion by five percent;
- (2) Increased quantity and quality of livestock forage;
- (3) Improved forage for wild herbivorous and seed eating animals.

d. Reduction of sediment from Eagle Draw into Pecos River by 57 percent.

e. Increased production and diversification of the composition of rangeland and shrubland vegetation within about 687 acres of the floodwater detention pool will create improved habitat conditions for wildlife species.

f. Fenced and seeded spoilbanks along both sides of the 20,100 linear feet of Channel 200 will provide high quality herbaceous food and cover for wildlife species.

g. Decreased water evaporation losses by about 260 acre-feet annually.

h. Reduction of unemployment in project area by six percent.

i. Improvement of social and economic environment by increasing income and reducing costs of maintenance.

4. Adverse Environmental Effects Which Cannot Be Avoided

a. Temporary disruption of ecological functions on 1,299 acres of rangeland by construction activities.

b. Destruction of about 69 acres of woody shrub vegetation occurring in Eagle Draw which furnished habitat for wildlife species.

c. Removal of some areas of brush in the upland which provides nesting and cover for a few birds and small animals.

d. The elimination of runoff overflow from about 720 acres of rangeland will result in reduction of vegetative diversity and production.

e. Creation of some dust and noise pollution during construction.

f. Commitment of about 1,299 acres of rangeland to dam, diversions, and channels.

g. Creation of a potential hazard from drowning for a few small animals when the detention pool fills rapidly.

5. Alternatives

a. Land Treatment Only.

Land treatment for the irrigated cropland would include conservation practices such as conservation cropping systems, crop residue use, irrigation water management, and other management practices. Proper grazing use, range deferred grazing, and stockwater development are the essential conservation practices to be installed on the range-land which covers 86 percent of the watershed. Structural practices such as land leveling, irrigation ditch lining, and irrigation pipelines would be installed to properly manage the existing water supply. The estimated cost for the land treatment is \$397,500.

This alternative would be beneficial to meeting the need for sustained and increased forage production, especially to the upland areas. These practices will improve the ground cover, increase livestock forage production, improve the quality of forage, and generally increase food and cover for wildlife.

The land treatment program alone would not provide adequate treatment for significantly reducing runoff and sediment yields. The flooding through the City of Artesia and surrounding cropland would continue. This would tend to discourage farmers and landowners from completing the land treatment program for the irrigated cropland subject to flooding. Approximately \$700,000 of the average annual damages would still occur.

b. Floodproofing and Zoning with Land Treatment.

This alternative considered zoning the 100-year floodplain and flood-proofing homes and businesses. The benefits and impacts of the land treatment program would be realized.

The present development in the 100-year floodplain would remain and future improvements would be restricted to projects that would not contribute to the flooding problem nor be susceptible to flood damage. These types of improvements could be parking lots or recreation areas.

Flood-proofing to the 100-year level would cost approximately \$6,000,000 and would provide protection to about 1,700 homes and 150 businesses. This cost would be the responsibility of the property owners. Flood walls would be constructed around the properties ranging up to about six feet high. Obtaining the participation of the property owners would be difficult. The walls would be objectionable aesthetically for the most part. The privacy provided by the walls would be favorable. The walls would provide additional obstructions to the flow of waters through the floodplain. This would tend to raise the water surface higher. Positive control of the floodwaters and sediments would not be realized. Protection would not be provided to utilities, roads, bridges or the railroad. The hazard to life and health would not be removed.

c. Diversion Levee and Channel Work with Land Treatment.

A large diversion levee was evaluated to divert flows around the city to the south. The levee, with its low water channel, would intercept flows from Eagle Draw and convey them to Tumbleweed Draw, then discharge the flows into the Pecos River below the City of Artesia. The levee would be designed to convey, at a minimum, the 100-year frequency runoff which is approximately 20,000 c.f.s. It would be located immediately west of 26th Street in Artesia. This plan included zoning of the land along the north and south forks of Eagle Draw to contain local runoff generated by the area below the proposed levee.

The average levee height would be about 12 feet with an average channel depth of about 4.5 feet. The structure would have a length of about 30,000 feet and would require about 138 acres. The flowage easement down Tumbleweed Draw from the end of the diversion levee to the Pecos River would require an average width of about 1,000 feet for a distance of three miles or about 900 acres. About 200 acres of land presently in cultivation would be included in the flowage easement.

The railroad track would need to be raised and a bridge required on the Atchison, Topeka and Santa Fe Railway crossing at Tumbleweed Draw. This bridge would be 816 feet long. Several drop structures would be needed to stabilize the channel.

Sediments from the watershed would continue to be conveyed into the river. These sediments would, under certain flow conditions, be deposited in the flow channel and cause

possible breaching of the diversion dike. The area of land needed for flowage easement would require a land use change. The 200 acres of irrigated cropland would change to a less intensive use. Wildlife use and grazing use of the flowage easement area would be interrupted.

d. Floodwater Retarding Structures and Channel Work with Land Treatment.

Several alternative dam locations were evaluated. A final location with the least adverse land use conflict was chosen. The land use conflicts which were avoided included an area for the development of a park and a producing oil field with expansion potential. Otherwise, the effects of the alternate locations for floodwater retarding structures are the same as the planned works of improvement.

An alternative of using floodwater retarding structures without channel work was considered. This permitted the principal spillway flows to be discharged into the natural drainage channels of Eagle Draw. The vegetation or natural stream regime would not be disturbed. Minimum drawdown times necessitated by evacuating the 25-year, 6-hour frequency storm from the reservoir required a flow that would exceed the capacity of the natural channel. The minimum drawdown time is the requirement of the New Mexico State Engineer. This flow would result in considerable flooding and erosion. Therefore, channel improvement along Eagle and Tumbleweed Draws was studied to convey the principal spillway flows to the Pecos River. The planning and subsequent construction of the Urban Renewal Project channel through Artesia as a green belt park, and its extension to the Pecos River by the Third District, obviated the need for other channel work along either fork of Eagle Draw, or the diversion of the principal spillway flows to Tumbleweed Draw. This channel has capacity to convey the flow from a 100-year frequency storm.

e. No Project.

This alternative would deprive the area of \$492,800 in benefits. Floodwaters, erosion, and the sediments would continue to damage urban and agricultural improvement. Farm operations would continue to be downgraded. Approximately 13,000 acres of irrigated cropland would be without protection from the floodwaters.

f. General.

Opportunities for incorporating storage for beneficial uses were investigated. Water supply limitations at desirable sites made multi-purpose objectives unfeasible. The water

supplies are limited, basically due to all water rights being appropriated. Existing water rights would need to be purchased by the local people and transferred to the beneficial uses incorporated. The present value of water rights is about \$500 per acre-foot.

6. Relationship Between Local Short-Term Uses of Man's Environment and the Maintenance and Enhancement of Long-Term Productivity

This plan provides a level of protection that is consistent with the needs and objectives of present and projected uses of the floodplain lands. The project is compatible with the projected future long-term use of the land. Agriculture is expected to remain an important source of income in the watershed. Proposed land treatment and structural measures will meet the need for sustained and increased production. The structural measures will provide the needed protection for a 100-year period. After this time, as the sediment encroaches on the floodwater pool, the level of protection will decrease.

The sponsors have planned this project with due consideration for the preservation of natural resource values and potential future developments. Installation of the project will provide flood protection to 1,920 acres already in intensive use and will permit the development and intensive use of another 12,800 acres that cannot be developed now because of flood hazards. This area is needed for the estimated 34,000 population growth expected by 2000 A.D. During this period, the family units needed for the area are estimated to be 6,800, an increase of 4,400 units. The current project under development by the Renewal Assistance Administration of the Department of Housing and Urban Development is dependent upon the watershed project.

Several downstream public recreational areas will be upgraded with playground equipment. It is not now feasible to do this because of flooding by Eagle Draw. Recreation resources take on a higher potential value with the application of the project.

The Eagle-Tumbleweed Watershed is located in the Upper Pecos River subarea of the Lower Rio Grande subregion. This subarea includes San Miguel, Guadalupe, De Baca, Chaves, and Eddy Counties in New Mexico (WRC Subarea 1306). In this subarea there are five P.L.-566 watershed projects that have been approved for installation--of these, structural measures have been completed on four. Two other watersheds, including Eagle-Tumbleweed, have been approved for planning in this portion of the Pecos River drainage. The completion of a 150-acre lake in Cottonwood-Walnut Creek Watershed will provide some recreation for the area.

The Eagle-Tumbleweed Draw Watershed Project work plan was reviewed by appropriate state and federal agencies and is compatible with other resource projects. The cumulative effects of the projects in the region were considered, although significant cumulative effects are not anticipated.

7. Irreversible and Irretrievable Commitments of Resources

The land set aside for floodwater retarding structures and associated outlet channel and diversions is the only irrevocable land use change which would preclude future developments.

About 1,299 acres of rangeland will be committed to the construction and operation of the dam, channel and diversions. Part of this land will recover to its present use, and none will be available for more intensive development.

8. Consultations with Appropriate Federal Agencies and Review by State and Local Agencies Developing and Enforcing Environmental Standards

a. General

Open meetings were held by the sponsors in the early planning stages to inform the public and to initiate a general plan of action. The Eagle Urban Renewal Project was initiated and administered by the Renewal Assistance Administration of HUD. The Soil Conservation Service and the consultants for the Urban Renewal Project coordinated efforts in developing the respective plans.

The New Mexico State Engineer's office was requested to and provided assistance with the structural measures. The USDI, Bureau of Land Management, assisted in developing the land treatment portion of the plan.

Oil companies with interests in the watershed were contacted in order to coordinate drilling locations with sites for watershed structures. They provided this information to the sponsors.

The Museum of New Mexico provided information on the possible existence of places of archeological or historical value in the construction areas. There are no apparent places of historical or archeological value within the construction areas.

The National Register of Historic Places has been consulted with the "Criteria for Effect" applied and no sites listed in the National Register will be affected by the project.

The sponsors held public meetings when the work plan was developed, and invited attendance of all agencies, organized groups, and individuals who could be identified with an actual or potential interest in the project.

b. Discussions and Disposition of Each Problem, Objection, or Issue Raised on the Draft Environmental Statement by Federal, State and Local Agencies, Private Organizations and Individuals

The following federal and state agencies were requested to review and comment on the work plan and draft environmental statement:

Department of the Army
Department of Commerce
Department of the Interior
Department of Health, Education, and Welfare
Environmental Protection Agency
Federal Power Commission
New Mexico State Engineer (Governor's Representative)
New Mexico State Planning Office (State Clearinghouse)
Urban Renewal Agency of Artesia (Agency for HUD)

Comments from responding agencies concerning the draft environmental statement are summarized below:

STATE PLANNING OFFICE

Comment

"On page 2, the statistics used should indicate the year and the source of the data."

Response

A footnote has been added to the table on page 7 to indicate the year and source of data.

Comment

"On page 3, personnel and per capita income figures for 1970 are now available and we suggest their use as opposed to the 1967 estimates."

Response

Estimates based on 1970 and 1971 data were used as suggested.

Comment

"The last sentence on page 3 and continued on page 4, we feel, is only partially valid - some estimates could be made. We feel also that a dollar value of loss to recreation at McMillan Lake and Avalon Lake due to sedimentation can be estimated and this value added to the cost benefit ratio of the project."

Response

The first full paragraph on page 23 was revised to include an estimate of the savings from sediment reduction in Lakes McMillan and Avalon.

Comment

"On page 6, it is not clear to us how annual agricultural benefits estimated at \$50,000 would accrue."

Response

The estimated average annual benefits of \$50,000 accruing to agriculture are the direct and indirect flood prevention benefits resulting from the project. It represents costs incurred as a result of flooding which would be eliminated and can be spent by agriculture for goods and services.

This paragraph (fifth on page 24) was revised to clarify these benefits.

Comment

"We would recommend and attempt to identify employment generated in the 'production of secondary benefits subsequent to the installation of the project.'"

Response

Existing evaluation criteria under PL-566 are that only primary benefits be specifically identified for project purposes and even then only within certain categories. Under these criteria, secondary benefits are to be recognized in all projects; however, are not used for project justification. Therefore, they are only identified in a general manner. The lead paragraph under Economic and Social benefits is revised to this benefit. Refer to page 23.

Comment

"On page 7, it would be helpful to indicate how the figure totaling \$32,000 was arrived at, representing average annual income in the watershed area from major farm enterprises."

Response

The paragraph including the \$32,000 has been revised to relate annual agricultural benefits of \$50,600 and secondary benefits of \$64,400. See page 24.

Comment

"The heavy emphasis on vehicular traffic volume and highway ratings for Chaves and Eddy Counties does not appear to us to be a significant measure of benefit or project justification."

Response

After further consideration this discussion was eliminated from the statement as having no direct value.

Comment

"On page 9, item G, the Environmental Impact Statement did not discuss the percentage or amount of sediment carried into the Pecos River."

Response

This has now been included. See page 13.

Comment

"On page 9 also, we do not feel that the project installation cost is an adverse 'environmental effect'."

Response

The item was removed from the environmental statement as having no real bearing.

Comment

"You could perhaps expand on the benefits accrued to property values along the urban renewal area and flood insurance reductions along the floodplain area."

Response

Due to lack of comparative sales information in this area, these benefits were not converted to monetary values. Land enhancement would occur and these benefits would be divided among the Urban Renewal Project, the Artesia-Eagle Draw Flood District Project and the PL-566 Project. Flood hazard insurance has not been established and approved for this area.

Comment

"Disagreed with comment on Table 6 in the flood danger reduction benefits from land treatment will be 'insignificant' in that land treatment measures in the amount of \$397,500 as stated on page 4 would make this a highly significant action, particularly in holding runoff and controlling erosion and sediment development at the source, thus reducing the destruction factor of flood action."

Response

It is significant as far as land stabilization, but not very significant as far as floodwater or sediment damage reduction is concerned.

DEPARTMENT OF THE ARMY

Comment

"Noted that about 94 percent of the flood damage reduction benefits credited to the project are related to residential, commercial, and industrial improvements in the watershed, and that controlling headwater floods up to 100-year frequency along Eagle Draw would not provide complete protection for the City of Artesia. In view of the potential hazard from overtopping should the storm runoff exceed the storage capacity of the proposed reservoir with high damages and possible loss of life resulting from a false sense of security, it would seem desirable to periodically call to the attention of the residents of Artesia the limitations of the Eagle-Tumbleweed Draw Project with respect to preventing flood damages from Eagle Draw."

Response

Although the floodwater retarding structure provides protection only up to the 100-year storm, the structure is designed to safely pass the peak flow from the storm

generated by the probable maximum precipitation. The PMP or freeboard hydrograph was developed from a 30-inch precipitation (point rainfall).

The point of publicizing the limitations has been incorporated into the statement. See page 21, paragraph 5.

Comment

"We foresee no conflict between the proposals of this work plan and any projects or current proposals of this Department. The draft environmental impact statement satisfies the requirements of Public Law 91-190, 91st Congress, insofar as this Department is concerned."

DEPARTMENT OF COMMERCE

Comment

"The Department of Commerce has reviewed the draft environmental statement and has no comment."

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

Comment

"Although the draft environmental impact statement indicates that land acquisition will be required for certain construction features of the project, it does not otherwise specify if dislocations will be a necessary resultant."

Response

A sentence has been added to the statement indicating that there will be no dislocations necessitated by this project. See page 19, paragraph 5.

DEPARTMENT OF THE INTERIOR

Comment

"The proposed plan of improvement will not have any significant impact on the fish and wildlife resources of the watershed. Land treatment measures in the form of grazing control and additional cropland could result in an improved habitat for upland game. Wildlife habitat could be further improved by planting food and cover

species along with grass on the spoil bank from channel excavation. The permanent fences on both sides of the channel will protect the planting from livestock grazing."

Response

Consideration of plants having wildlife value will be given when preparing plans for vegetation of spoil.

Comment

"The proposed improvements will not impact on any existing, proposed or known potential units of the National Park system nor any historic, natural, or environmental education sites eligible or considered potentially eligible for the National Landmark Program. The project as now proposed will have no adverse effect on mineral resources in the area."

"The proposed plan is located upstream of a potential project in our Reclamation Program, the Brantley Project and the existing Carlsbad Irrigation District. The work plan is compatible with the existing development and the Brantley Project."

Response

None.

Comment - Project Description

"We suggest that the statement provide a more detailed description of the project in terms of both the features to be constructed and the supporting programs that will be undertaken during the life of the project."

Response

The section of the statement, Planned Project, has been rewritten to address these suggestions. Efforts were coordinated with the local urban renewal and park and recreation authorities to develop open space--greenbelt/urban trail and recreation areas. The constructed channel through the urban renewal area has been seeded, park areas established and recreational facilities installed.

A detailed operation and maintenance agreement will be executed after detailed designs are completed and prior to construction of the PL-566 phase of the project. This agreement will include the responsibilities of all parties. See page 16.

Comment

Environmental Setting - "The subparagraph discussing fish and wildlife resources should mention that the Pecos Gambusia (Gambusia Nobilis), a species of fish listed by the Bureau of Sport Fisheries and Wildlife as endangered, may be present in the area."

Response

It has been determined that the Pecos Gambusia (Gambusia Nobilis) is not present in the Eagle-Tumbleweed Watershed. This has been included in the discussion of Fish and Wildlife, page 26.

Comment

"The discussion of archeological and historic resources on page 5 indicates that there are no apparent archeological or historic values within the construction area. This portion of the statement needs further elaboration to indicate whether or not a thorough archeological-historical survey of the construction area has been made. If the situation is that these values are unknown, then an archeological-historical survey is needed to (1) determine the presence or absence of such values, (2) provide a basis for evaluation for the environmental statement needs, and (3) define any salvage program and cost needed to mitigate the loss of this resource base. If these values are present, then project impacts should be reflected in the appropriate section of the statement."

Response

A paragraph has been added to the statement regarding consultation with the Museum of New Mexico. See page 32. There has also been added a paragraph regarding precautions that will be taken during construction. See page 21.

Comment

"The statement should contain (1) a sentence indicating that the National Register of Historic Places has been consulted with the "Criteria for Effect" applied and that no National Register properties will be affected by the project, or (2) a listing of the properties affected are identified, an analysis of the nature of the effects is also made and a discussion is given of the ways these effects were taken into account. The statement should also give an account of the steps taken to insure compliance with Section 106 of the National Historic Preservation Act of 1966 in

accordance with the procedures of the Advisory Council on Historic Preservation (see the Federal Register of March 15, 1972)."

Response

The suggestion has been complied with and the sentence has been inserted in the statement. See page 33.

Comment

"The statement should contain evidence of contact with the Historic Preservation Officer for the State of New Mexico (Acting State Planning Officer, State Capitol, 403 Capitol Building, Santa Fe, New Mexico 87501). A copy of his comments concerning the effects of this project upon any lands which may be in the process of nomination to the National Register should be appended to the statement."

Response

Copies of letters indicating: (1) request for historical or archeological data, and (2) response letter concerning the effects of the project on historical or archeological data are attached.

Comment

"The land treatment measures discussed in the fourth full paragraph of page 4 could result in an improved wildlife habitat. Additional benefits to wildlife can be realized from a reasonable but special additional effort. Food and cover plants might be placed on the spoil banks along the river, along fence rows, and at fence corners. Brush control, as suggested in the fifth paragraph, should be kept to a minimum as this practice in most instances would reduce wildlife habitat."

Response

Brush control will be used on selected sites where brush is not natural for the site. Control measures will be planned in patterns to enhance the natural landscape and provide open space for animals and birds. See page 16, in the section Planned Project.

Comment

Environmental Impacts - "The statement can indicate that any environmental problems that may result from geologic or hydrologic conditions should be recognizable from pre-construction investigations and their correction should be well within the range of standard engineering practice."

"The statement should indicate that the project, as proposed, will have no adverse environmental impact on mineral resources of the study area."

Response

The paragraphs were inserted into the statement. See page 21.

Comment

"The last sentence in the first paragraph of this section states that wildlife will increase due to increased food supply. This may not be true unless suitable cover for escape and nesting is also provided."

Response

This was an obscure observation and has been deleted from the statement.

Comment

"We believe that project occasioned environmental impacts along the Pecos River should also be discussed in greater detail."

Response

The project will have relatively significant environmental impacts on the Pecos River in the reduction of sedimentation, which is discussed on page 23. The reduction in peak flows and other minor effects are considered to be insignificant.

Comment

Alternatives - "More detailed information should be given for the environmental impacts that are related to the alternatives cited in this section."

Response

More detailed information as suggested is included in the statement.

Comment

Short Term Use Versus Long Term Productivity - "This section states that due to water supply limitations and lack of desirable sites multi-purpose structures are not considered feasible. Such a conclusion should be documented with information such as annual inflow expected from the watershed, quality of water, physical site limitations, yield and pool size if permanent storage was to be provided. Such data is essential to any reviewer assessing the feasibility of multi-purpose structures."

Response

The discussion relating to multi-purpose objectives has been added to page 30.

ENVIRONMENTAL PROTECTION AGENCY

Comment

IV. "This section should be a brief description of the project with the major land treatment and structural measures listed as they are under VI, Alternatives Considered."

Response

This item has been rewritten to show the kind of action and the project purposes and an itemization of practices to be installed.

Comment

V. B. Adverse Environmental Effects Which Cannot Be Avoided

2. "The intent of this section is to list impacts which are expected to have adverse effects on the environment. Project installation cost should be included in the description of the project."

Response

Project cost was deleted from Adverse Environmental Effects summary and is included in the description of the project. See page 17 and following.

Comment

"The statement on page 3 that 'damaging floods which inundate areas of Artesia and large acreages of the surrounding farm land occur on an average of once every three or four

years' is not borne out by the years listed. For the years given, the average interval between damaging floods is 6.1 years."

Response

The sentence was intended to convey the thought that "Some of the more damaging floods occurred in 1905, 1908" It has been changed to read accordingly. See page 11.

Comment

"The description of the structural measures on pages 4 and 5 is not clear in the discussion of 'diversions.' We believe these 'diversions' could be better described as drainage or collecting channels and that their specific purpose should be given. The work plan contains more information and diagrams on the 'diversions' than the statement, but a better descriptive term is desirable in the report, also."

Response

The description of the structural measures has been re-written to clarify these points. See pages 18 and 19 and following.

Comment

"The statement on page 5 that the sediment pool will usually be dry should be explained by reference to the rainfall characteristics of the watershed and to means for draining the sediment pool."

Response

Additional information has been added to the statement regarding the drainage of the sediment pool. See page 17 and following.

Comment

"Some information should be given in the statement on plans or methods for maintaining low flows in the channel below the floodwater retarding structure."

Response

The information has been added to the statement. See page 21.

Comment

b. "As indicated above, the project installation cost should not be listed as an adverse effect."

Response

The installation cost was deleted as an adverse effect.

Comment

c. "Measures to reduce or control generation of dust and noise during construction operations should be outlined in the Environmental Statement."

Response

The discussion of these measures has been added to the statement. See page 19.

Comment

"Since a project of the Renewal Assistance Administration of the Department of Housing and Urban Development in the area is dependent on the watershed project, that department should be asked to review the Environmental Statement."

Response

A final Environmental Statement and work plan were sent to the Renewal Assistance Administration. The letter of response is attached. The Agency that reviewed the work plan and environmental statement was the Urban Renewal Agency of Artesia which is an agency for HUD.

Comment

"The discussion of the impacts of the project on the area was generally complete; however, we have the following questions:

a. What measures will be taken for water, air, and noise pollution control and abatement during construction, operation and maintenance of the project?"

Response

The discussion of these measures has been added to the statement. See page 19.

Comment

b. "What effect will there be from commitment of land presently used for agricultural purposes to long-term use as a floodwater retarding area?"

Response

Effects have been expanded in the impact section. See page 31.

Comment

c. "What are the secondary benefits, as mentioned in the statement, that will be gained, and what are the tertiary adverse impacts that will be caused when they are achieved? Although an increase in employment is expected, specific types of industry and effects on area resources from this employment were omitted."

Response

These benefits would accrue as increased profits to commercial outlets for agricultural supplies and materials, as increased profits to the transportation, processing, and marketing sectors and to increased wages and salaries related thereto. As such, the project is not anticipated to induce new industries which would impact on the local environment. Likewise, due to the historical precedent and project unemployment for the project area, it is anticipated that most gains in project induced employment will reflect savings in welfare payments; therefore, project induced effects on the area resources from this employment should be minimal.

Comment

"The present quality of water in the area and the effect of increased herbicides and pesticides to be used on increased farm acreage to be gained from the project on the water quality should be documented in writing the Final Environmental Statement."

Response

There will be no increased farm acreage to be gained from the project.

Comment

"The enlargement of the outlet channel through the middle of the City of Artesia will probably have more adverse impacts on the human environment than the construction of the floodwater retarding structure. We feel that more information concerning that portion of the project should be included in the Final Environmental Statement, particularly the following:

- a. Placement of the spoil for the process of enlarging of the channel.
- b. Measures to prevent wind and water erosion of the spoil.
- c. The present and proposed width, depth, and length of the channel.
- d. Any change in the elevation or velocity of the channel waters due to the enlargement, as this would have an effect on the recharging of the alluvial fan aquifer, which contains the city's public water supply wells.
- e. Relocations of families or businesses due to channel enlargement or change of direction. If there are to be any relocations, suitable housing must be provided for families involved and businesses should be located in areas where the public utilities are capable of providing needed services.
- f. Social discomfort and economic loss to people and businesses due to disruption of traffic patterns, increased noise from construction operations, and other impacts due to implementation of the project.
- g. Measures to prevent accidental spillages from or contamination of public water supplies or other utilities during relocation to accommodate implementation of the project."

Response

The channel through Artesia is completed and the channel area has been established as a green belt park area. The Department of Housing and Urban Development has performed an exemplary service in Artesia. The program is essentially complete in all respects including a comprehensive

relocation assistance program, and these needs were considered. The enlargement of this channel was not a part of the PL-566 Project.

9. List of Appendixes

Appendix A - Comparison of Benefits and Costs for Structural Measures

Appendix B - Letters of Comment Received on the Draft Environmental Statement

Appendix C - Project Map

APPROVED DM Whitt DATE DEC 20 1973

Acting Administrator
Soil Conservation Service

COMPARISON OF BENEFITS AND COSTS FOR STRUCTURAL MEASURES

Eagle-Tumbleweed Draw Watershed, New Mexico

(Dollars)

| Evaluation Unit | AVERAGE ANNUAL BENEFITS 1/ | | | | Average : Annual 4/ : Cost | Benefit : Cost Ratio |
|-------------------------------------|----------------------------|------------------------------|--------|---------|----------------------------|----------------------|
| | Damage : Reduction 2/ | Secondary : Redevelopment 3/ | Total | Cost | | |
| Site 2B, Channel 200, FD-1 and FD-2 | 719,800 | 95,600 | 64,400 | 879,800 | 353,850 | 2.5:1 |
| Project Administration | | | | | 33,150 | |
| GRAND TOTAL | 719,800 | 95,600 | 64,400 | 879,800 | 387,000 | 2.3:1 ^{5/} |

1/ Price Base - ANP.2/ It is estimated flood damage reduction benefits from land treatment will be insignificant.3/ In addition, there will be in this watershed \$188,000 of damage reduction benefits and \$16,300 of secondary benefits accruing to measures in the Cottonwood-Walnut Creek Project.4/ From Table 4.5/ Based upon 5-1/8% discount rate applicable when the plan was developed. The benefit-cost ratio is 1.5 to 1 based upon the discount rate of 6-7/8% which became effective on October 25, 1973, in accordance with the Water Resources Council's Principles and Standards.

APPENDIX B

LETTERS OF COMMENT



STATE OF NEW MEXICO

STATE ENGINEER OFFICE

SANTA FE

S. E. REYNOLDS
STATE ENGINEER

BATAAN MEMORIAL BUILDING
STATE CAPITOL
SANTA FE, NEW MEXICO

| | Reply |
|-----------|-------|
| ST CONS | |
| ASC/M | |
| ASC/RS-W | |
| ASC/P | |
| RAO | |
| SSS | |
| RES. CONS | |
| SOE | |

WS-PL566-16-5-Eagle Tumbleweed May 5, 1972

X file

Comments - work Plan
- Environment

Mr. Marion E. Strong
State Conservationist
Soil Conservation Service
P. O. Box 2007
Albuquerque, New Mexico 87103

Dear Marion:

Enclosed for your information is a copy of Mr. Reynolds' letter to Mr. Grant approving the Eagle-Tumbleweed Watershed work plan.

Sincerely,

S. E. Reynolds
State Engineer

By: *F. R. Allen*
F. R. Allen, Chief
Technical Division

FRA*rmg

Enclosure



STATE OF NEW MEXICO

STATE ENGINEER OFFICE

SANTA FE

BATAAN MEMORIAL BUILDING
STATE CAPITOL
SANTA FE, NEW MEXICO 87501

S. E. REYNOLDS
STATE ENGINEER

May 4, 1972

Mr. Kenneth E. Grant, Administrator
U. S. Soil Conservation Service
Washington, D. C. 20250

Dear Mr. Grant:

Reference is made to your letter of April 11, 1972 and the attached Eagle-Tumbleweed Watershed work plan dated February, 1971 and the tentative environmental statement.

I hereby approve the work plan. I suggest no changes in the tentative environmental statement as presented.

It is our hope that early funding may be obtained for this project so that construction can proceed at the earliest possible date because the City of Artesia and the surrounding area could under existing conditions experience a disastrous flood.

Yours truly,

A handwritten signature in dark ink, appearing to read "S. E. Reynolds".

S. E. Reynolds
State Engineer

SER*rmg



STATE PLANNING OFFICE

SANTA FE

OFFICE OF DIRECTOR

June 1, 1972

Mr. Marion E. Strong
State Conservationist
USDA - Soil Conservation Service
Post Office Box 2007
Albuquerque, New Mexico 87103

Dear Mr. Strong:

Subject: Review of Draft Environmental Statement
Eagle-Tumbleweed Draw Watershed
OMB Circular A-95 Compliance

Thank you for the opportunity to review the above subject draft environmental statement. This letter will serve to certify compliance with OMB Circular A-95 notification requirements.

First, let me say we are very pleased to see this project about to come to fruition. It has been the subject of much discussion in that part of the State and, in our opinion, one that should reflect an extremely good cost benefit ratio, perhaps even better than indicated in your draft statement.

The review comments are intended only to suggest improvements to the document and are not to be interpreted as a negative evaluation.

We would like to suggest that a copy be made available to Mr. Nick Pappas, Executive Director, Southeastern New Mexico Economic Development District, Post Office Box 6639 RIAC, Roswell, New Mexico 88201. His name was not listed under those from whom comments have been requested.

Our review comments are as follows:

1. On page 2, the statistics used should indicate the year and the source of the data.
2. On page 3, personnel and per capita income figures for 1970 are now available and we suggest their use as opposed to the 1967 estimates.

Mr. Marion E. Strong
State Conservationist
USDA - Soil Conservation Service
June 1, 1972

-2-

3. The last sentence on page 3 and continued on page 4, we feel, is only partially valid - some estimates could be made. We feel also that a dollar value of loss to recreation at McMillan Lake and Avalon Lake due to sedimentation can be estimated and this value added to the cost benefit ratio of the project.

4. On page 6, it is not clear to us how annual agricultural benefits estimated at \$50,000 would accrue.

5. We would recommend and attempt to identify employment generated in the "production of secondary benefits subsequent to the installation of the project."

6. On page 7, it would be helpful to indicate how the figure totaling \$32,000 was arrived at, representing average annual income in the watershed area from major farm enterprises.

7. The heavy emphasis on vehicular traffic volume and highway ratings for Chaves and Eddy counties does not appear to us to be a significant measure of benefit or project justification.

8. On page 9, item G, the Environmental Impact Statement did not discuss the percentage or amount of sediment carried into the Pecos River. We think it would be a plus factor to so indicate.

9. On page 9 also, we do not feel that the project installation cost is an adverse "environmental" effect.

There are many important and impressive statistics and observations in the statement, particularly the 98 per cent flood danger reduction to the City of Artesia and the compatibility of the project with the Artesia Urban Renewal project. You could perhaps expand on the benefits accrued to property values along the urban renewal area and flood insurance reductions along the flood plain area.

We are not sure that we agree with your comment made on Table 6 in that flood danger reduction benefits from land treatment will be "insignificant". We would think that land treatment measures in the amount of \$397,500 as stated on page 4 would make this a highly significant action, particularly in holding runoff and controlling erosion and sediment development at the source thus reducing the destruction factor of flood action.

Mr. Marion E. Strong
State Conservationist
USDA - Soil Conservation Service
June 1, 1972

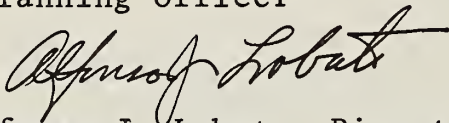
-3-

Enclosed is the form SPO-A95-1 for your handling. It is required by this office that this form be completely filled out and returned to the State Clearinghouse as soon as possible. The instruction for completion of this form is contained on the back of the form. It is essential that the descriptions and money fields are accurate since this form is used later as input into an automated Project Notification and Review System.

It would be a great help to this office if you could include a location map of the Eagle-Tumbleweed Draw Watershed with your return of the form SPO-A95-1 to this office.

Sincerely,

David W. King
State Planning Officer



by: Alfonso J. Lobato, Director
State Clearinghouse and Grant Notification

AJL:bse

Enclosure

| A-95 PROJECT NOTIFICATION AND REVIEW SYSTEM PRE-APPLICATION NOTICE | | | | | | | | | |
|--|---|--|-----------------------------|--|---|--|--|--|-----------------------------|
| NEW MEXICO PNRS APPLICATION | | | | | STATE APPLICATION IDENTIFIER 18 | | CARO TYPE 9 | | |
| (DO NOT WRITE ABOVE LINE 01.) | | | | | | | | | |
| 10-11 01 | PROJECT TITLE 12-71 | | | | | | APPLICANT PROJ. NO. 72-80 | | |
| 02 | APPLICANT 12-45 | | | | DEPARTMENT 46-79 | | | | |
| 03 | APPLICANT ADDRESS (street) 12-45 | | | | CITY 46-60 | | | ZIP CODE 76-80 | |
| 04 | CONTACT PERSON 12-45 | | | | AREA CODE 46-48 | | PHONE 49-55 | | EX: 56-59 |
| 05 | 12-71 PROJECT DESCRIPTION - NATURE, PURPOSE AND BENEFICIARIES (use 4 lines if needed) | | | | | | | | |
| 06 | 12-71 | | | | | | | | |
| 07 | 12-71 | | | | | | | | |
| 08 | 12-71 | | | | | | | | |
| 09 | KEY WORDS (BY APPLICANT) | | | | | | | | |
| | 12-28 | | 29-45 | | 46-62 | | 63-79 | | |
| 10 | PROJECT LOCATION (S.P.O. DISTRICT) 12-71 | | | | | | | | |
| 11 | PROJECT LOCATION CITY (S) 12-45 | | | | PROJECT LOCATION COUNTY(S) 46-79 | | | | |
| 12 | FEDERAL FUNDS | | NON-FEDERAL MATCHING FUNDS | | OTHER | | TOTAL | | |
| | (A) GRANT 12-19 | (B) OTHER 20-27 | (C) STATE 28-35 | (D) LOCAL 36-43 | (E) FUNDS 44-51 | (F) FUNDS 52-60 | | | |
| | | | | | | | | | |
| 13 | TYPE OF OTHER FEDERAL FUNDS (B) 12-45 | | | | TYPE OF OTHER NON-FEDERAL FUNDS (E) 46-79 | | | | |
| 14 | FEDERAL PROGRAM TITLE 12-71 | | | | | | FED. CAT. NO. | | |
| 15 | FEDERAL AGENCY NAME 12-45 | | | | FEDERAL SUB-AGENCY 46-79 | | | | |
| TYPE OF APPLICANT: (check (x) the single most applicable box) | | | | | | | | | |
| STATE | INTER-STATE | COUNTY | INDIAN | CITY | SCHOOL DISTRICT | SPECIAL UNIT | COMMUNITY ACTION | SPONSORED ORGANIZATION | OTHER |
| <input type="checkbox"/> 12 | <input type="checkbox"/> 13 | <input type="checkbox"/> 14 | <input type="checkbox"/> 15 | <input type="checkbox"/> 16 | <input type="checkbox"/> 17 | <input type="checkbox"/> 18 | <input type="checkbox"/> 19 | <input type="checkbox"/> 20 | <input type="checkbox"/> 21 |
| TYPE OF ACTION: (check (x) as many boxes as apply to this action) | | | | | | | | | |
| 17 | NEW GRANT | CONTINUATION GRANT | SUPPLEMENT GRANT | INCREASE DURATION | DECREASE DURATION | CANCELLATION | INCREASE DOLLARS | DECREASE DOLLARS | |
| | <input type="checkbox"/> 22 | <input type="checkbox"/> 23 | <input type="checkbox"/> 24 | <input type="checkbox"/> 25 | <input type="checkbox"/> 26 | <input type="checkbox"/> 27 | <input type="checkbox"/> 28 | <input type="checkbox"/> 29 | |
| IS STATE PLAN REQUIRED? | | IS REGIONAL PLAN REQUIRED? | | IS THERE A CITY COMPREHENSIVE PLAN? | | IS PROJECT UNDER A-95 JURISDICTION? | | IS THERE AN ENVIRONMENTAL IMPACT STATEMENT? | |
| Yes <input type="checkbox"/> 30 No <input type="checkbox"/> 31 | | Yes <input type="checkbox"/> 32 No <input type="checkbox"/> 33 | | Yes <input type="checkbox"/> 34 No <input type="checkbox"/> 35 | | Yes <input type="checkbox"/> 36 No <input type="checkbox"/> 37 | | Yes <input type="checkbox"/> 38 No <input type="checkbox"/> 39 | |
| Yes <input type="checkbox"/> 40 No <input type="checkbox"/> 41 | | | | | | | | | |
| CONGRESSIONAL DISTRICT 42-43 | | | | LEGISLATIVE DISTRICT 44-45 | | | SENATORIAL DISTRICT 46-47 | | |
| ESTIMATE DATE TO FILE APPLICATION 48-53 | | | | | | | | | |
| Mo. Day Year | | | | | | | | | |
| - NON-COMPUTER DATA - | | | | | | | | | |
| I. | GIVE A JUDGEMENT AS TO THE NATURE AND EXTENT OF THE ENVIRONMENTAL EFFECT ANTICIPATED, INCLUDE ANY ADVERSE EFFECTS THAT CANNOT BE AVOIDED AND ANY ALTERNATIVES TO THE CHOSEN COURSE OF ACTION. | | | | | | | | |
| II. | LIST ANY PLANNING DOCUMENTS OR PROJECT STUDIES PERTINENT TO THIS APPLICATION: | | | | | | | | |
| III. | HAS FEDERAL FUNDING AGENCY BEEN NOTIFIED? | | | HAS STATE FUNDING AGENCY BEEN NOTIFIED? | | | HAS AREA PLANNING ORGANIZATION BEEN NOTIFIED? | | |
| | Yes <input type="checkbox"/> No <input type="checkbox"/> | | | Yes <input type="checkbox"/> No <input type="checkbox"/> | | | Yes <input type="checkbox"/> No <input type="checkbox"/> | | |
| IV. | Signature _____ Date _____ | | | | | | | | |

NOTICE TO THE APPLICANT: Disregard all numbers except those on left hand column on reverse side.

INSTRUCTIONS FOR COMPLETION OF EARLY WARNING NOTICE FORM

Complete this application by typing or printing with black ink. Give all the details called for below and submit the completed form to the Executive Director or Chairman of the Regional Planning Commission in which the project is located and to the Director, Central Information and Technical Services, State Planning Office, 403 Legislative Executive Building, Santa Fe, New Mexico 87501. Failure to complete all questions may result in a processing delay of your application. If additional space for completion of the answers is required, please attach a memorandum keyed to the appropriate question number. Also attach a map indicating the project site.

STATE APPLICATION IDENTIFIER and CARD TYPE. Leave Blank. Clearinghouse will assign a number.

Line 01. PROJECT TITLE: A brief descriptive name of the project. Use location of the project title when feasible.
Example: "Albuquerque Airport Expansion"

APPLICANT PROJECT NO.: Project No. assigned by the federal agency, when given.

Line 02. APPLICANT: The State Agency, County, City, Town or other unit of government authorized and making application for federal aid.

DEPARTMENT: When applicable, the sub-agency of the applicant responsible for administering the project, i.e., City Police Dept., City Park Board.

Line 03. APPLICANT ADDRESS: Street, City, Zip

Line 04. CONTACT PERSON: The representative of the applicant who may be contacted if further information is necessary, and his telephone number.

Lines 05-08. PROJECT DESCRIPTION: A brief narrative description of the nature, purpose and beneficiaries of the project.

Line 09. KEY WORDS: Starting from left and moving to the right, there are 4 boxes. Fill in as many boxes as possible describing the project by use of key words. Such as:

| | | | |
|--------------|--------|------------|---------|
| Construction | School | Vocational | Nursing |
|--------------|--------|------------|---------|

Line 10. PROJECT LOCATION — S.P.O. DISTRICT: Name of the District Planning Organization in which the project is to be located.

Line 11. PROJECT LOCATION — CITY: Name of the city in which the project is to be located and the name of the county.

Line 12. Round off funds to nearest whole dollar. Use NO PUNCTUATION (\$., etc.)

- A. Grant federal funds
- B. Other federal funds
- C. State funds
- D. Local funds
- E. Other, i.e. Donation
- F. Total funds

Line 13. Explain (B) what the federal funds are.

Explain (E) what other non-federal funds are.

Line 14. FEDERAL PROGRAM TITLE: Enter program title and catalog number as listed in the current OMB catalog of Federal Domestic Assistance

Line 15. FEDERAL AGENCY NAME and FEDERAL SUB-AGENCY: Enter the administering federal agency and sub-agency as:

- C. State funds
- D. Local funds
- E. Other, i.e. Donation
- F. Total funds

Line 17. Check (x) must be used.

Cols. 12-21: Check (x) the appropriate type of applicant.

Cols. 22-24: Check (x) as to the type of action. Check (x) as many boxes as apply to this action.

Cols. 30-41: Check (x) a "yes" or "no" for each question that is asked.

IS STATE PLAN REQUIRED? Yes or No
IS REGIONAL PLAN REQUIRED? Yes or No
IS THERE A CITY COMPREHENSIVE PLAN? Yes or No
IS PROJECT UNDER A-95 JURISDICTION? Yes or No
IS THERE AN ENVIRONMENTAL IMPACT STATEMENT? Yes or No
IS LOCAL SHARE AVAILABLE? Yes or No

Cols. 42-43: Insert the Congressional District number.

Cols. 44-45: Insert the Legislative District number.

Cols. 46-47: Insert the Senatorial District number.

Cols. 48-53: This date must be filled in.



DEPARTMENT OF THE ARMY
OFFICE OF THE UNDER SECRETARY
WASHINGTON, D.C. 20310

County Administrator for
Watershed
SOIL CONS. SERVICE

1 JUN 1972

Honorable Thomas K. Cowden
Assistant Secretary of Agriculture
Washington, D. C. 20250

Dear Dr. Cowden:

In compliance with the provisions of Section 5 of Public Law 566, 83d Congress, the Administrator of the Soil Conservation Service, by letter of 7 April 1972, requested the views of the Secretary of the Army on the work plan for Eagle-Tumbleweed Draw Watershed, Eddy and Chaves Counties, New Mexico.

While a portion of the area of the Eagle-Tumbleweed Draw Watershed is devoted to agriculture, it is noted that about 94 percent of the flood damage reduction benefits credited to the project are related to residential, commercial and industrial improvements in the watershed. The Corps of Engineers, in their review, note that controlling headwater floods up to 100-year frequency along Eagle Draw would not provide complete protection for the city of Artesia. In view of the potential hazard from overtopping should the storm runoff exceed the storage capacity of the proposed reservoir with high damages and possible loss of life resulting from a false sense of security, it would seem desirable to periodically call to the attention of the residents of Artesia the limitations of the Eagle-Tumblewood Draw project with respect to preventing flood damages from Eagle Draw.

We foresee no conflict between the proposals of this work plan and any projects or current proposals of this Department. The draft environmental impact statement satisfies the requirements of Public Law 91-190, 91st Congress, insofar as this Department is concerned.

Sincerely,

Charles L. Ford
for Kenneth E. BeLieu
Under Secretary of the Army



Deputy Administrator for
Watersheds

THE ASSISTANT SECRETARY OF COMMERCE
Washington, D.C. 20230

May 12, 1972

Mr. Kenneth E. Grant
Administrator
Soil Conservation Service
U.S. Department of Agriculture
Washington, D. C. 20250

Dear Mr. Grant:

The draft environmental statement for "Eagle-Tumbleweed Draw Watershed, Eddy and Chaves Counties, New Mexico," which accompanied your letter of April 12, 1972, has been received by the Department of Commerce for review and comment.

The Department of Commerce has reviewed the draft environmental statement and has no comment.

We are pleased to have been offered the opportunity to review this statement.

Sincerely,

Sidney R. Galler
Deputy Assistant Secretary
for Environmental Affairs



DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
OFFICE OF THE SECRETARY
WASHINGTON, D.C. 20201

JUN 8 1972

Mr. Kenneth E. Grant
Administrator
Soil Conservation Service
U.S. Department of Agriculture
Washington, D. C. 20250

Dear Mr. Grant:

Secretary Richardson has asked me to reply to your letter of April 7, 1972, wherein you requested comments on the Watershed Work Plan and draft environmental impact statement for the Eagle-Tumbleweed Draw Watershed, New Mexico.

This Department has reviewed the health aspects of the above project as presented in the documents submitted. Although the draft environmental impact statement indicates that land acquisition will be required for certain construction features of the project, it does not otherwise specify if dislocations will be a necessary resultant. The assumption on our part is that there will be some dislocations necessitated by a project of this magnitude. If such is the case, the statement should so specify and indicate that provisions of the "Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970" will be uniformly applied.

The opportunity to review the watershed work plan and draft environmental impact statement is appreciated.

Sincerely yours,

Merlin K. DuVal, M.D.
Assistant Secretary for
Health and Scientific Affairs



Deputy Administrator,

Waterhole
SOIL CONS. SERVICE

United States Department of the Interior

OFFICE OF THE SECRETARY
WASHINGTON, D.C. 20240

ER-72/439

JUN 16 1972

Dear Mr. Secretary:

This is in reply to your letter of April 7, 1972, requesting our views and comments on a work plan and draft environmental statement for the Eagle-Tumbleweed Draw Watershed, Eddy and Chaves Counties, New Mexico. We have completed our review and submit the following comments for your consideration and use.

The proposed plan of improvement will not have any significant impact on the fish and wildlife resources of the watershed. Land treatment measures in the form of grazing control and additional cropland could result in an improved habitat for upland game. Wildlife habitat could be further improved by planting food and cover species along with grass on the spoil bank from channel excavation. The permanent fences on both sides of the channel will protect the planting from livestock grazing.

The proposed improvements will not impact on any existing, proposed or known potential units of the National Park System nor any historic, natural or environmental education sites eligible or considered potentially eligible for the National Landmark Program. The project as now proposed will have no adverse effect on mineral resources in the area.

The proposed plan is located upstream of a potential project in our Reclamation Program, the Brantley project and the existing Carlsbad Irrigation District. The work plan is compatible with the existing development and the Brantley project.

We did experience some difficulty in reviewing the report and draft statement. The problem seemed to originate with a loosely written project description. While there is a fairly complete description of the watershed area as a whole, the physical description of the project features, particularly the channel, appears to be vague.

The lack of descriptive information about the channel right-of-way caused some problems. Without knowledge of its present condition it is difficult to judge the impact of construction on the local drainage. Further, we note that the right-of-way through the city of Artesia is facilitated by an urban renewal project. Urban renewal ordinarily involves clearing most existing structures from the work area. Consequently, speaking from a recreation/environmental viewpoint, both the work plan and statement should discuss the coordination efforts with the local urban renewal and park and recreation authorities in order to combine the flood control project with the opportunity to develop open space--greenbelt/urban trail and recreation areas. Although the material on hand precludes judgment as to the feasibility of such cooperation, the possibility for significant environmental enhancement should not be overlooked. This is particularly the case when there may be an opportunity to improve the environmental setting of a channelized floodway.

The work plan and the draft statement do not give adequate information relating to ownership and future management responsibilities for the land to be devoted to project purposes. To illustrate, no mention is made of the proposed release schedule when floodwaters are retained. A more detailed discussion of the Federal and non-federal responsibilities during the life of the project is needed.

Page 16 of the work plan refers to utility line relocations in paragraphs three and seven. Consideration should be given to burying these lines as this could have a beneficial impact on the environmental setting.

We have reviewed the draft environmental statement and submit the following comments for your consideration and use in developing a final statement for this project.

Project Description - We suggest that the statement provide a more detailed description of the project in terms of both the features to be constructed and the supporting programs that will be undertaken during the life of the project.

Environmental Setting - The subparagraph discussing fish and wildlife resources should mention that the Pecos Gambusia (*Gambusia nobolis*), a species of fish listed by the Bureau of Sport Fisheries and Wildlife as endangered, may be present in the area.

The discussion of the impacts of the project on the area was generally complete; however, we have the following questions:

a. What measures will be taken for water, air, and noise pollution control and abatement during construction, operation and maintenance of the project?

b. What effect will there be from commitment of land presently used for agricultural purposes to long-term use as a floodwater retarding area?

c. What are the secondary benefits, as mentioned in the statement, that will be gained, and what are the tertiary adverse impacts that will be caused when they are achieved? Although an increase in employment is expected, specific types of industry and effects on area resources from this employment were omitted.

The present quality of water in the area and the effect of increased herbicides and pesticides to be used on increased farm acreage to be gained from the project on the water quality should be documented in writing the Final Environmental Statement.

The enlargement of the outlet channel through the middle of the town of Artesia will probably have more adverse impacts on the human environment than the construction of the flood-water retarding structure. We feel that more information concerning that portion of the project should be included in the Final Environmental Statement - particularly the following:

a. Placement of the spoil from the process of enlarging of the channel.

b. Measures to prevent wind and water erosion of the spoil.

c. The present and proposed width, depth and length of the channel.

d. Any change in the elevation or velocity of the channel waters due to the enlargement, as this would have an effect on the recharging of the alluvial fan aquifer, which contains the city's public water supply wells.

Environmental Impacts - The statement can indicate that any environmental problems that may result from geologic or hydrologic conditions should be recognizable from pre-construction investigations and their correction should be well within the range of standard engineering practice.

The statement should indicate that the project, as proposed, will have no adverse environmental impact on mineral resources of the study area.

The last sentence in the first paragraph of this section states that wildlife will increase due to increased food supply. This may not be true unless suitable cover for escape and nesting is also provided.

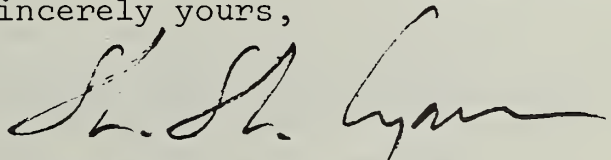
We believe the project occasioned environmental impacts along the Pecos River should also be discussed in greater detail.

Alternatives - More detailed information should be given for the environmental impacts that are related to the alternatives cited in this section.

Short Term Use Versus Long Term Productivity - This section states that due to water supply limitations and lack of desirable sites multipurpose structures are not considered feasible. Such a conclusion should be documented with information such as annual inflow expected from the watershed, quality of water, physical site limitations, yield and pool size if permanent storage was to be provided. Such data is essential to any reviewer assessing the feasibility of multipurpose structures.

We wish to thank you for the opportunity to review the report and draft statement for this project.

Sincerely yours,



Deputy Assistant Secretary of the Interior

Honorable Earl L. Butz
Secretary of Agriculture
Washington, D. C. 20250

ENVIRONMENTAL PROTECTION AGENCY

REGION VI

1600 PATTERSON, SUITE 1100

DALLAS, TEXAS 75201

May 18, 1972

OFFICE OF THE
REGIONAL ADMINISTRATOR

Mr. Kenneth E. Grant
Administrator
United States Department of Agriculture
Soil Conservation Service
Washington, D. C. 20250

06-2-186-NM
06-2-IIB-11-NM

Dear Mr. Grant:

We have reviewed the Watershed Work Plan and the Draft Environmental Statement on Eagle-Tumbleweed Draw Watershed, Eddy and Chaves Counties, New Mexico. This project provides for watershed protection and flood prevention through land treatment and structural measures to be installed over a four-year period. The structural measures are designed to reduce average annual floodwater and sediment damages to agricultural land by 69%, with practical elimination of all flood damages to the City of Artesia.

The Work Plan and Environmental Statement state that the project's benefits, particularly prevention of flooding, far outweigh the adverse effects on the environment.

The following comments and suggestions are for your consideration and pertain to the paragraphs of the Environmental Statement indicated:

SUMMARY SHEET:

IV. This section should be a brief description of the project with the major land treatment and structural measures listed as they are under VI, Alternatives Considered.

V. B. Adverse Environmental Effects Which Cannot Be Avoided:

2. The intent of this section is to list impacts which are expected to have adverse effect on the environment. Project installation cost should be included in the description of the project.

ENVIRONMENTAL STATEMENT:1. Description.Environmental Setting:

The statement on page 3 that "damaging floods which inundate areas of Artesia and large acreages of the surrounding farmland occur on an average of once every three or four years" is not borne out by the years listed. For the years given, the average interval between damaging floods is 6.1 years.

The description of the structural measures on pages 4 and 5 is not clear in the discussion of "diversions." We believe these "diversions" could be better described as drainage or collecting channels and that their specific purpose should be given. The Work Plan contains more information and diagrams on the "diversions," than the statement, but a better descriptive term is desirable in the report, also.

The statement on page 5 that the sediment pool will usually be dry should be explained by reference to the rainfall characteristics of the watershed and to means for draining the sediment pool.

Some information should be given in the statement on plans or methods for maintaining low flows in the channel below the floodwater retarding structure.

4. Adverse Environmental Effects Which Cannot be Avoided.

b. As indicated above the project installation cost should not be listed as an adverse effect.

c. Measures to reduce or control generation of dust and noise during construction operations should be outlined in the Environmental Statement.

6. Relationship Between Local Short-Term Uses of Man's Environment and the Maintenance and Enhancement of Long-Term Productivity.

Since a project of the Renewal Assistance Administration of the Department of Housing and Urban Development in the area is dependent on the watershed project, that department should be asked to review the Environmental Statement.

The discussion of archeological and historic resources on page 5 indicates that there are no apparent archeological or historic values within the construction area. This portion of the statement needs further elaboration to indicate whether or not a thorough archeological-historical survey of the construction area has been made. If the situation is that these values are unknown, then an archeological-historical survey is needed to (1) determine the presence or absence of such values, (2) provide a basis for evaluation for the environmental statement needs, and (3) define any salvage program and cost needed to mitigate the loss of this resource base. If these values are present, then project impacts should be reflected in the appropriate sections of the statement.

The statement should contain (1) a sentence indicating that the National Register of Historic Places has been consulted with the "Criteria for Effect" applied and that no National Register properties will be affected by the project, or (2) a listing of the properties affected are identified, an analysis of the nature of the effects is also made and a discussion is given of the ways these effects were taken into account. The statement should also give an account of the steps taken to insure compliance with Section 106 of the National Historic Preservation Act of 1966 in accordance with the procedures of the Advisory Council on Historic Preservation (see the Federal Register of March 15, 1972).

The statement should contain evidence of contact with the Historic Preservation Officer for the State of New Mexico (Acting State Planning Officer, State Capitol, 403 Capitol Building, Santa Fe, New Mexico 87501). A copy of his comments concerning the effects of this project upon any lands which may be in the process of nomination to the National Register should be appended to the statement.

The land treatment measures discussed in the fourth full paragraph of page 4 could result in an improved wildlife habitat. Additional benefits to wildlife can be realized from a reasonable but special additional effort. Food and cover plants might be placed on the spoil banks along the river, along fence rows and at fence corners. Brush control, as suggested in the fifth paragraph, should be kept to a minimum as this practice in most instances would reduce wildlife habitat.

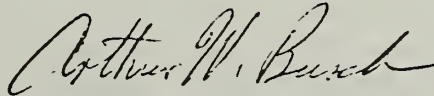
e. Relocations of families or businesses due to channel enlargement or change of direction. If there are to be any relocations, suitable housing must be provided for families involved and businesses should be located in areas where the public utilities are capable of providing needed services.

f. Social discomfort and economic loss to people and businesses due to disruption of traffic patterns, increased noise from construction operations, and other impacts due to implementation of the project.

g. Measures to prevent accidental spillages from or contamination of public water supplies or other utilities during relocation to accommodate implementation of the project.

We appreciate the opportunity to review the Watershed Work Plan and the Draft Environmental Statement on this project. Please send us two copies of the Final Environmental Statement when it is available.

Sincerely yours,

A handwritten signature in cursive script, reading "Arthur W. Busch". The signature is written in dark ink and is positioned above the printed name.

Arthur W. Busch
Regional Administrator



MUSEUM OF NEW MEXICO, P.O. BOX 2087, SANTA FE, NEW MEXICO 87501

July 28, 1972

Mr. Clarence Haverland
Watershed Planning
U.S. Soil Conservation Service
Federal Office Building
Albuquerque, New Mexico 87101

Dear Mr. Haverland:

Pursuant to our previous telephone conversation, we have checked information available to us and see no indication that the Eagle-Tumbleweed Watershed Project (Site 2B) west of Artesia, New Mexico, will have significant effect upon archeological or historic resources. This opinion is based upon limited information in our files and not upon a field reconnaissance. The character of the terrain does not suggest an area suited to habitation, however, due to the possibility of the existence of early period campsites, it is recommended that provision be made for a field inspection by a trained archeologist on such projects in the future.

Sincerely,

George H. Ewing
Assoc. Director

GHE/mbo



URBAN RENEWAL AGENCY
OF ARTESIA



POST OFFICE DRAWER Y
ARTESIA, NEW MEXICO 88210

A.C. 505 746-9877

August 31, 1972

Soil Conservation Service
P. O. Box 235
Artesia, New Mexico 88210

ATTENTION: Clarence Haverland

Dear Sir:

With regards to your request for this agency to review the Draft Environmental Statement, it is the feelings of this agency that the before mentioned statement complies with the goals set forth by the City of Artesia and thusly we give our concurrence on this statement.

If we can be of any further assistance in the future, please do not hesitate to call on us.

Sincerely,

T. A. HULSMAN
Assistant Executive Director

TAH/eb

Enclosure

